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ORIGINAL ARTICLES.

THE DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF PULMONARY ABSCESS AND GANGRENE, WITH VIEW TO SURGICAL TREATMENT.

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In dealing with the pulmonary diseases to be considered in this paper the surgeon is confronted with the following questions: 1. Is the affection in reality abscess or gangrene of the lung? 2. Can the focus be reached and should it be operated on? 3. Are the pleural surfaces overlying the affected part of the lung adherent? A correct answer to these queries requires fine diagnostic ability at all times, while it not infrequently baffles the diagnostician altogether.

To answer the first query requires a differential diagnosis between abscess and gangrene on the one hand, and on the other, the differentiation of these from the following conditions: an abscess of some adjacent structure, as of the liver, that has ruptured into the lung; an encysted empyema; an echinococcus cyst of the lung; bronchiectasis; fetid bronchitis and pulmonary tuberculosis. I shall not deal with hepatic or other abscess perforating the lung; previous history and symptoms ought ordinarily to guard against mistaking it for an original pulmonary affection.

In attempting to distinguish abscess from gangrene one should not only remember that they have much in common as regards causation and symptomatology, but also that in some cases a sharp dividing line can not be drawn. The recognition of a local lung destruction, gangrenous or otherwise, depends not alone on physical examination of the chest. Indeed, in some cases this may furnish less information than do the history and symptoms. Thus may be discovered a pyemia, a puerperal septicemia, or some distinct localized infection, which, by throwing light on the etiology, may materially assist in a correct interpretation of the symptoms and physical signs of the chest affection. The patient may be found to have been intemperate and to have just had croupous pneumonia, or a child may have aspirated a foreign body into his lungs, or there may be an erysipelas, and quinsy and the like to serve as a probable cause of subsequent pulmonary infection. I recall a man in the Cook County Hospital who died of multiple pulmonary gangrene resulting from an old middle ear abscess that had led to pyelo-phlebitis of the right internal jugular vein.

There are four cardinal symptoms alike of pulmonary abscess and gangrene: pain in the affected lung, dyspnea, cough and fever. These are not distinctive, as they may all be present in purulent pleurisy. It may be said however, that in pulmonary abscess and gangrene thoracic pain is likely to be more persistent and severe, since, with the on-coming of effusion the pain of pleurisy often abates, even when it does not cease. Moreover, if the abscess be of embolic origin, it is announced by sudden sharp pain at the seat of the embolus. In hydatid cyst of the lung, on the other hand, pain may be a marked feature. Upon rupture of a pulmonary abscess into a bronchus there is generally agonizing pain, accompanied or followed by violent cough that ushers in the expectoration of pus, but identical phenomena attend the rupture of pus into the lung from a hepatic abscess or from the pleural cavity. With the evacuation of the abscess pain diminishes or ceases.

Dyspnea is a variable symptom, depending on the extent of lung involved and associated pleurisy, and possesses no characters peculiar to this affection. It may be shallow and hurried in consequence of intensification of pain when respiration is slow and deep; or breathing may be labored and difficult. In brief, this symptom may be said to denote some pulmonary embarrassment, but not its nature or location. Cough is a symptom of great importance, since it likewise points to lung disease, but it possesses no characters pathognomonic of abscess. In general it may be said to be more severe and paroxysmal than that of empyema and phthisis but not of bronchiectasis and gangrene, in which last-named affection it also racks the sufferer intolerably. The fever is that of sepsis, depending in its *minima* and *maxima* upon the kind of micro-organisms concerned in its production. For the most part its extremes are of wider range and its type more irregular than in either of the other affections excepting gangrene, while in bronchiectasis pyrexia may be absent. It is almost needless to remark that accompanying the irregularly intermitting fever are more or less pronounced rigors, sweating and loss of both weight and strength, all of them phenomena of grave constitutional infection.

So long as the abscess contents remain confined within the lung the sputum is of negative value and there is nothing in the symptomatology to denote the character of the inflammatory process occasioning it. So soon, however, as rupture into a bronchus occurs the characters of the expectoration assume the greatest importance. If it be a suppurative pleuritis or an abscess of some adjacent structure that has broken through into the lung, the sputum will, except immediately following the rupture, consist of pus without pulmonary tissue; whereas, if an abscess of the lung has ruptured, elastic fibers and fragments of pulmonary tissue will be mingled with the pus. The color is yellow or yellowish-green and there is generally no odor.

If the condition be gangrene and not abscess, the characters of the expectoration are very striking and different. Its most impressive feature is its almost unendurable fetor, alike distressing to patient and attendants. This may be of an indescribably sweetish character or it may be that of decomposing blood, or mingled with the stench of putridity is a fecal odor. It is most intense during the act of coughing, although the patient's breath is contaminated by it at all times, as is the atmosphere of the sick-room. The sputum has a dirty gray or brownish or brownish-green color and when allowed to settle in a glass divides into three layers. The uppermost consists of froth of the characteristic hue and contains mucus; the middle one is serous, transparent and albuminous; while the bottom layer, thick, greenish-brown, contains masses which horribly fetid consist of shreds of pulmonary tissue. According to Leube, elastic fibers are only present when the sphacelated parenchyma has been expectorated before the peptic ferment, shown to be present by Filehne and others, has had time to dissolve them. But even when elastic tissue is absent the microscope detects fibers having the characteristic alveolar arrangement. In addition, this bottom layer contains disintegrated blood cells, oil drops, hematoidin crystals, pigment granules, crystals of the triple phosphates and the various fatty acids, Dittrich's plugs, leptothrix and numerous micro-organisms.

A reliable diagnosis of pulmonary gangrene can only be made by a microscopic examination of the sputa, since a similar fetor of the breath may be detected in cases of bronchiectasis and fetid bronchitis. Even in these affections shreds of lung tissue may appear in the sputa when under the influence of decomposition of the retained secretions the bronchial wails soften and break down and the adjacent parenchyma becomes a prey to the necrotic process. In such instances a differential diagnosis is extremely difficult, if not impossible, and one must be guided largely by the history and duration of the malady. It might well be in such cases that the patient's emaciation and prostration would not have reached so extreme a degree as would exist had his ailment been gangrene from the start.

From the foregoing, it is seen that so long as expectoration is wanting the symptomatology of abscess and gangrene is practically the same (except that the latter often runs a much more rapid course) and that it is often impossible to establish the diagnosis prior to rupture and discharge through the bronchi. Some etiologic factor, as pyemia or the aspiration of a foreign body, may render the existence of one or the other disease likely and suggest which of the two it is, but the character of the sputum alone can determine the diagnosis.

Although the physical signs are of great importance and should never be neglected, they can not be relied on to clear up the diagnosis before the establishment of expectoration. These are the following: Dulness over a circumscribed area of variable size, provided the seat of lesion is not deeply situated, is single and large enough to alter the percussion note. If a cavity becomes established and other conditions are favorable the note is tympanitic. Upon auscultation the breath sounds are found to be bronchial, or if the area has broken down but not yet ruptured and evacuated, they will be suppressed, while the transmission of vocal fremitus is correspondingly altered. Râles over the affected area are usually wanting during this period. Should the focus be sub-pleural, the auscultatory phenomena of fibrinous pleuritis are likely to be added. If croupous pneumonia have preceded, there will have been signs of this affection.

It is now necessary to consider the diagnosis of cavity, inasmuch as the surgeon in dealing with abscess or gangrene has to be familiar with the means of determining when it has formed. To this end percussion is chiefly to be relied on, yet certain conditions are indispensable if percussion is to avail anything: 1, the vomica must have attained a sufficient size, at least that of a walnut; 2, solidified lung tissue must supervene between it and the surface percussed; 3, the cavity walls must possess sufficient resistance and smoothness to reflect the vibrations communicated to them; 4, the waves of air produced must have sufficient amplitude to produce the overtones essential to tympany.

If these conditions be fulfilled, percussion over a cavity will elicit tympanitic resonance, the pitch of which depends upon the length and number of the vibrations within the cavity. But other conditions than a vomica can give rise to this kind of resonance, as for instance, when cracked-pot resonance is produced by strong percussion of a child's chest in case of bronchitis. Wintrich suggested as diagnostic the change of pitch observed under favorable circumstances when the patient closed his mouth during the act of percussion. That is, when the vomica communicates freely with a bronchus, the pitch of the percussion note is perceptibly higher with the mouth open than with it shut. This, however, is not absolute and therefore Gerhardt's change of pitch was proposed as a diagnostic test. This consists of an alteration of pitch depending on the patient's position; if the cavity be longer in one direction than another and it contains fluid, change the patient's position, as from the recumbent to the erect or *vice versa*, will, through gravitation of the contents to the bottom of the vomica, correspondingly elevate the pitch of the percussion note. Either the Wintrich or the Gerhardt change of pitch is ordinarily proof enough of the presence of a cavity, but if the diagnostician is still captious, he may seek for the so-called interrupted Wintrich change of pitch. That is, when with the mouth open a rise of pitch in the percussion note is detected only in a certain position, as the recumbent, but not in the sitting posture. An elevation of the pitch during slow inspiration over that during expiration is also a sign of cavity, but of all of these none is held to be pathognomonic except the interrupted Wintrich change of pitch. In addition to the foregoing is that peculiar quality of note known as cavernous and amphoric, which must have been heard to be recognized, since it can not be described.

Upon auscultation of a vomica there may be heard bronchial, cavernous or amphoric breathing, which does not require more than mention. Likewise, there are the cavernous or amphoric voice and certain râles. Of these last the most significant are the gurgles or bubbling râles heard during inspiration, and the metallic tinkle of Laennec. A conjunction of two or more of the signs just mentioned may, in a given case, establish a diagnosis, although none of them be pathognomonic.

Finally, a differential diagnosis must be made in this early stage between a suppurative inflammation of the lung and circumscribed empyema. To this end the previous history and symptoms must largely contrib-

ute, owing to the similarity of the physical signs. The problem is rendered still more difficult by the following considerations: Abscess is a relatively frequent result of lobar pneumonia, while circumscribed pyothorax is often found complicating this form of pneumonia. The pneumococcus gives rise to a pleuritic exudate rich in fibrin and hence it becomes readily encysted. It is generally circumscribed within the confines of the lobe affected with the pneumonia, sometimes occupying the whole, but more often a part of this area, and through the failure of the dull patch to clear up after the crisis it may give rise to the belief that resolution has not taken place. Should this collection of pus, circumscribed under great pressure, at length break through into a bronchus, it is very apt to be mistaken for abscess. It should be remembered however, that pulmonary abscess generally occasions far greater constitutional disturbance; fever is higher and more distinctly septic; rigors are more pronounced and perspirations more intense; the patient's strength and weight decline more rapidly, and what is more important, local pain and cough are usually more severe. Pus produced within the pleural cavity by the pneumococcus is rather benign in character and unless mixed with strepto- or staphylococci, occasions only symptoms of mild infection. When, however, admixture with pyogenic organisms takes place, the pus becomes correspondingly more virulent and septic phenomena proportionately greater.

The importance of the information derived through physical exploration of the chest will depend upon the amount and depth of the exudate. If this be sufficient to threaten rupture, there is likely to be more or less evidence of pressure. Careful inspection and palpation will detect slight filling or smoothing out of the intercostal spaces over the affected area, and the side is apt to show slight elevation of the ribs, thus giving a little more rotundity to that part of the thorax. If the exudate compress the lung to an appreciable degree, the apex beat will generally be displaced, although accurate observation is often required for its determination. In my experience, an exudate of this kind is rarely massive enough to occasion appreciable displacement of the liver. Particularly careful study of the pectoral fremitus, and of the breath sounds, as recommended by Potain, will often furnish valuable differential information. I have repeatedly detected feeble vibration, extending into the distinctly dull zone, and being absent only over the very center of dulness, seeming thus to indicate a gradual increase in depth of the exudate from periphery to center. Such would not be the case in abscess and gangrene, for pectoral fremitus is usually exaggerated over the affected focus, during the inflammatory stage, and after evacuation, but absent after the lung substance has broken down, and before evacuation. In empyema, upon percussion, dulness is generally found to shade off gradually into resonance, the transition being less abrupt than in abscess. Upon auscultation the breath sounds may be either inaudible or, in case the exudate be not too deep, enfeebled and bronchial. In some instances, I have detected a vague friction sound about the edge of the dull patch, while in others, it has been rather an indefinite impression of a rubbing of rough surfaces rather than actual friction sounds.

Should the pent-up pus of empyema at length find exit through the bronchi, the event may be correctly interpreted by examination of the sputum, which as already stated does not contain elastic tissue except at the very beginning of or soon after the onset of the perforation. The physical signs will then become those of a cavity, and if the case be then seen for the first time, a differential diagnosis may be extremely difficult or impossible. The percussion note is tympanitic, and the respiratory sounds tubular or even amphoric, and moist râles or perhaps metallic tinkling may be heard. The loud and whispered voice-sounds should be carefully studied, for, unless the communication with the air-passages be very free, they would hardly be such as are heard over vomicæ of such dimensions. In the event of a failure of differential diagnosis, and the amelioration of symptoms that ensues renders surgical interference unnecessary, the subsequent history will probably clear up the doubt. In case of empyema, convalescence is more rapid and steady.

The differential diagnosis between pulmonary abscess and tuberculosis with formation of vomicæ is easy, although it must be borne in mind, as stated by Leube, that the seat of suppuration following pneumonia is most frequently the upper lobe. In consumption generally, the history and symptoms indicate a chronic disease, but it should be a case of acute pneumonic phthisis, with rapidly forming cavity, the detection of tubercle bacilli in the sputum, together with disintegrating lung tissue, will settle the diagnosis.

One of the most difficult tasks is to differentiate between pulmonary abscess and bronchiectasis, or in some instances between gangrene and bronchiectasis with fetid bronchitis. Here again as always, the anamnesis is of the utmost importance, pointing in the one case to an acute, while in the other to a chronic malady. Moreover, only very exceptionally are elastic tissue fibers, having an alveolar arrangement, present in the expectoration of bronchial dilatation, and when these do occur, the case has been converted into one of abscess to all intents and purposes, and may be treated as such. Not often does bronchiectasis present conditions favorable for diagnosis in respect to determining its operability. Its existence may be strongly suspected from history and symptoms, such as chronicity of the malady, the violent, spasmodic cough and thick muco-purulent sputum that is sometimes most readily expelled in certain positions and does not contain pulmonary tissue, etc., but it may be quite another matter to accurately locate the cavity, and to state whether more than one exists. As a rule, bronchiectases are multiple, and surgeons of experience like Dodlee assert that operative interference is successful only when a single, large sized dilatation exists at the base of the lung. In such a case, the physical signs are those of a cavity from any other cause, and have already been considered. A very significant sign of bronchiectasis is the detection of tympanitic resonance over a circumscribed area which prior to cough and expectoration presented dulness, and where bronchial breathing then replaces former absence of respiratory sounds.

The only disease remaining, from which pulmonary abscess must be differentiated, is echinococcus cyst of the lung. Pain in the affected side, sometimes very intense, severe and spasmodic cough and prostration are also present. Dulness does or does not exist only as the cyst is superficial or deep seated. In the latter event, there may sometimes be heard dis-

tant, numerous crackling râles over a considerable area. If suppuration be set up roundabout the cyst, sepsis may supervene and abscess be still more closely simulated. The one diagnostic feature is the expectoration of a thin, serous fluid containing the characteristic rolled up membranes, or hooklets. Morillou states that the diagnosis is confirmed, even before this pathognomonic expectoration, by the appearance of urticaria during the course of this obscure affection. Fortunately hydatid cysts are very rare in this country.

Suppposing that abscess or gangrene either before or after cavity formation, has been satisfactorily determined to be present, the question arises, is the condition operable? This depends on its etiology and location. If it be pyemic in origin, operation will probably prove of but little avail since other foci than that operated on may be scattered through the lungs. On the other hand, the abscesses most amenable to surgical treatment are those resulting from pneumonia, and in general also, they are the most readily diagnosed. Unfortunately, experience has shown that even when a pus cavity has been located by physical signs, the operator may have much difficulty in reaching it with the exploring needle. This is said to be owing to the fact that a cavity usually lies higher than is supposed.

Lastly, arises the query, whether or not the pleural surfaces overlying the affected part be adherent? If the seat of pulmonary inflammation be directly underneath the pleura, or if in the course of the disease pleuritic friction sounds have been detected in said area, then adhesion of the pleura may be strongly suspected. But more than this can not be affirmed in the present state of our knowledge.

I will now briefly describe a few cases that illustrate some of the difficulties encountered in the diagnosis of the affections under discussion:

Case 1.—In the very beginning of my practice I attended a young woman with pneumonia of the middle lobe of the right lung. After a few days her sputum became very copious, of a brownish red color and of the characteristic odor of decomposing flesh or blood. It was not examined microscopically, but as not many days subsequently a small zone of tympany developed at the lower edge of dulness, I concluded that gangrene had set in. My diagnosis seemed confirmed by the continuance of the fetid sputa, the septic symptoms and above all the gradual spreading of marked tympany, until at length it involved the entire area of original dulness. Convalescence now set in slowly and progressed until the patient was able to get about, although with troublesome cough and considerable purulent expectoration. The middle lobe now presented the following signs: Pronounced tympany, bronchial breathing, that could be plainly heard behind, pectoriloquy, some moist râles, and more than all, distinct bulging of the intercostal spaces in this area upon coughing. This last seemed to leave no room for doubt of the existence of a cavity. Dr. Christian Fenger concurred in the diagnosis, and a few days later operated by the means of the actual cautery. Two or three days subsequently the patient died, and the necropsy revealed, not a vomica, but multiple racemose bronchiectases throughout the entire area over which signs of a vomica had been erroneously thought to exist. This showed that the bulging of intercostal spaces during the expiratory pressure of coughing can not, as supposed by the late Austin Flint, be considered diagnostic of cavity.

Case 2.—This was a female patient in my service at Cook County Hospital five or six years ago. I made a diagnosis of diaphragmatic empyema at the base of the left lung, following pneumonia. Dr. Holmes operated, but instead of empyema found multiple small abscesses containing a cheesy material, and scattered along the base of the lower lobe from front to back, close to the diaphragm. At the time he looked upon these as tubercular, but I now conjecture that they were multiple abscesses, such as sometimes form in the course of broncho-pneumonia. The patient made an uneventful recovery.

Case 3.—Some years ago I was asked to see an elderly man who had passed through a recent croupous pneumonia, which was thought not to have resolved, but to have resulted in an abscess that had ruptured into a bronchus. He had had a low septic fever with harassing dry cough, and the day before my visit had suddenly begun to cough up pus.

Signs of a cavity had appeared at the right base, below the scapula. After careful examination of the chest and due consideration of the previous history and symptoms, I made a diagnosis of an encysted empyema, which had broken through into the lung, and advised operative interference. This was carried out, and in so doing the correctness of my diagnosis was determined.

Case 4.—Not far from that time, I saw another man, who had just passed through a lobar pneumonia that was thought not to have properly resolved, but to have resulted in abscess. A mild septic temperature persisted, with troublesome cough, and a zone of dulness over which breath sounds were absent, remained at the right base, behind. I diagnosed encysted empyema and advised an operation, which was done. Upon the surgeon's having entered the pleural sac slightly too far to one side, and having failed to find pus, he introduced his finger and felt the abscess wall, which seemed to him to bulge from the surface of the lung into the pleural cavity. He thereupon passed his instrument along his finger as a guide, and opened the supposed abscess from a little below and anteriorly. As he did so, air escaped with the pus. Therefore, he naturally concluded that my diagnosis was an error. Fortunately, however, I had requested to have a specimen of the pus obtained brought to me, and microscopic examination of this specimen showed an entire absence of pulmonary tissue. Obviously there was but one conclusion, that the lung had been perforated simultaneously with the penetration of the empyema. Both these last patients made a satisfactory recovery.

Case 5.—About a year ago Dr. Bayard Holmes asked me to see an elderly man who complained of pain in his left chest, behind near the region of the kidney. There was a history of an obscure affection that had been diagnosed about a year previously as abscess of the spleen. Two or three months prior to my seeing the patient, Dr. Holmes had made an exploratory incision over the left kidney and found it healthy; at the same time, all the abdominal organs were palpated by laparotomy and found normal. Examination of the lungs disclosed a dull area, with bronchial breathing and faint friction-like râles at the extreme base of the left lung, extending from the vertebral column, forward nearly to the posterior axillary line. A positive opinion was not given, but as the patient had a mild pyrexia, I concluded a thin layer of not very infective pus was encysted in the

pleural cavity and advised operative measures for the man's relief. Dr. Holmes subsequently reported that he found an aneurysm of the descending aorta that compressed the base of the lung. The interesting feature of the tumor was, that it did not pulsate and was so firm that it was not recognized until the doctor inserted a hypodermic needle and withdrew blood. The aneurysm had begun to erode the vertebræ. The patient lingered for a few weeks and died of rupture of the aneurysm.

103 State Street.

A UNIQUE CASE OF PERINEO-SUPRAPUBIC SECTION.

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Through the courtesy of Drs. Griffith and Ryan of St. John's Hospital, Springfield, Illinois, I had the opportunity of operating a few days since, upon a most interesting case. A man 45 years of age, occupation mechanic, sustained a fall upon his perineum some nine years ago. This was followed by urethral hemorrhage, with considerable swelling and ecchymosis in the perineal region. Retention of urine occurred, and the catheter was used for some days. A few weeks after the injury the patient noticed that his already lessened stream of urine was rapidly diminishing in size. The contraction of the urethra continued until complete retention recurred. The catheter was again resorted to, and, satisfied with temporary relief, the patient did nothing in the way of treatment until another attack of retention came on. This was treated as the other attacks had been, and with equal success. During the many years since the original injury the patient has experienced a number of attacks of retention, and has been treated by sounds at intervals. On various occasions considerable hemorrhage resulted from the passage of the sounds. The contraction of the urethra finally became so marked that more or less constant dribbling of urine from overflow resulted.

Examination showed a well nourished man of fairly good physique. The bladder was not distended with urine, although dribbling from the meatus was almost constant. The condition of the patient's clothing and the ammoniacal odor about him showed that this was of by no means recent development—an inference corroborated by the history. The prostate was apparently normal. Exploration showed the urethra to be free from contractions until the bulbo-membranous region was reached, at which point a firm fibrous contraction was noted. This proved to be impermeable to instruments. Had time permitted, however, it is probable that a filiform guide might have entered. The perineum was hard and somewhat swollen, peri-urethral inflammation, probably from slight infiltration, had perhaps occurred.

Perineal section was proposed and consented to.

Operation: Chloroform was used, as is my custom in long-standing cases of obstructive surgical disease of the urinary tract. After flushing the urethra with a 1-20,000 bichlorid solution, a grooved staff was passed down to the face of the stricture. The urethra was then opened in front of the obstruction, and a search for the opening in the stricture begun. The membranous urethra was found to be completely obliterated, the bulb being encroached upon and contracted for about an inch anterior to the bulbo-membranous opening. After a careful dissection, occupying fully three-quarters of an hour, the cicatricial tissue was divided, and my index finger apparently entered the urethra and penetrated the bladder. I could plainly feel the vesical rugæ, and the grip of the characteristically hypertrophied false sphincter vesicæ found in such cases. Much to my surprise, however, no urine escaped, nor could I detect fluid with the exploring finger. Suspecting that I had entered an old, false passage, I began a fruitless search for the normal canal, lasting probably half an hour. It has been my custom of late years, in such cases, to refrain from a too prolonged and dangerous search for the urethra in the perineum. I believe that suprapubic section and retrograde exploration with the finger or catheter does not greatly complicate matters, nor does it add much to the dangers of the operation. Prolonged anesthesia and hemorrhage are the elements of the operation that are most to be dreaded. These can be avoided by suprapubic section. In accordance with this view I entered the bladder above the pubes. I found the viscus very slightly distended with urine. I punctured the bladder well down toward the vesical neck, making an opening only as wide as the blade of the medium-sized scalpel I was using. I inserted a pair of forceps into the puncture, and, opening them, stretched the wound sufficiently to admit my left index finger. There was little trouble in dilating and exploring the vesical neck from within. On opposing the intra-vesical and perineal index fingers I found, as I had suspected, that I had entered a blind false passage. The thin lining of this canal covered my finger like the finger of a glove, and through it I had felt the rugæ of the vesical walls. After restoring the continuity of the urethra and laying the two canals into one, I proceeded to still further divide all the cicatricial tissue detected by the finger in the perineum. In accomplishing this an old peri-urethral abscess sac was discovered, containing eight small phosphatic calculi. This sac was thoroughly laid open.

The perineal wound was drained by a large firm rubber tube, about which iodoform gauze was tightly packed to check hemorrhage. No attempt was made to close the bladder wound. The suprapubic incision was almost entirely closed by catgut and silkworm gut sutures. A single narrow strip of gauze was pushed well down into the cavity of Retzius, no other provision for suprapubic drainage being made. The subsequent course of the case was uneventful. The temperature rose but very slightly. Perineal drainage was perfect; not a drop of urine escaped through the suprapubic wound, which healed by first intention, the gauze drain being removed on the fifth day, at which time the perineal tube was also removed.

The technique and results of the combined section in this case are worthy of note. The ideal healing of the suprapubic wound in the face of infection from the bladder was remarkable, though I have seen a number of similar results. The danger of leakage where the method adopted in this case is followed is practically *nil*. It is unnecessary and unwise to suture the bladder in such cases. Leakage can not occur unless the bladder becomes distended—which it never does if perineal drainage is free. A vesical opening that will readily admit the finger is difficult to find in the collapsed bladder. As a cardinal prin-

ciple, therefore, vesical exploration and operations should involve as little cutting as possible. This is wise even where stones are to be extracted.

Once the technique of suprapubic section has been mastered, the surgeon need not dread perineal section without a guide. There can be no justification, moreover, for a prolonged and dangerous perineal search for a lost urethra. In intensely septic cases, through and through drainage is advisable.

The rationale of the stone formation in the foregoing case is simple. Decomposing residual urine in an old peri-urethral pus cavity explains it. The false passage was probably of "surgical" origin, and had deluded several surgeons into the belief that they were successfully dilating the stricture. Such errors are by no means rare.

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PERINEAL OPERATION FOR PERFORATIVE APPENDICITIS WITH ABSCESS IN THE CUL-DE-SAC.

Read before the Peoria Medical Society, May 3, 1898.

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PEORIA, ILL.

The literature on the surgical treatment of appendicitis is replete, and it is the consensus of opinion that, for ordinary cases of perforative appendicitis with abscess formation the incision over McBurney's point, or the extra-peritoneal operation from the side, reaching the abscess without entering the peritoneal cavity, with simple evacuation and drainage, only removing the appendix when possible to do so without causing general infection, are the best methods of procedure.

In looking over the reports of cases it has not come to my knowledge that an operation reaching the appendix abscess, when located back of the bladder, below the small intestine, and in front of the rectum, has been operated on from the perineum. The difficulties of draining these cases through the abdominal incision and the avoidance of soiling the peritoneum are barriers which render the operation useless and fatal when attempted above, except when the operation is made before perforation or before any large quantity of pus has formed.

When the appendix lies externally or behind the caput coli the operation for appendicitis becomes quite simple, and those are the cases which encourage the physician to become a surgeon. But when the appendix lies internal to the caput coli, above the mesentery of the small intestine, the most skilled operators may have grave fears of the result. When the appendix lies below the mesentery of the small intestine, internal to the caput coli and perforation occurs, abscess forms, pressing on the rectum or the bladder. When the small intestine forms the upper wall of the abscess and the tendency of the case is toward rupture into the bladder or rectum, or both, with long-continued illness, never closing abscess sac or sinus, in some cases recovery may take place, or in others, death may follow from general peritonitis. It is not the diagnosis of appendicitis alone, which every skilled physician should be able to make, but the locating of the appendix, which marks the skilled surgeon, as upon this point the success of any given operation may depend.

By the following I wish to point to the possibilities of diagnosing the appendix perforation with abscess formation, in the somewhat unusual place, the pelvic cavity of the male, and also the advantage of reaching the same extra-peritoneally, from the perineum.

Mr. F. A., age 35, locomotive fireman, stout build, perfect health, on the evening of March 16, after drinking a glass of milk and eating a light lunch in a restaurant, was suddenly seized with pain that was referred to every place over the entire abdomen. Returning home, a distance of ninety-three miles, a physician was sent for and gave him the proper treatment for appendicitis. The pain, locating itself along the lower part of the abdomen, over the symphysis, was continuous and extreme. The bowels responded to saline cathartic. The pulse was 100, temperature 100 to 102 degrees. March 19, third day of the attack, examination of the patient revealed a tumefaction high up in the median line and to the right of the rectum. There was scanty urine, bowels responding to the use of salines, but greatly distended. There was profuse perspiration, pulse 96 to 100, temperature 100.

Having had sad results from operations for appendicitis through the median line for this class of cases when seen late, I counseled delay, as perforation had taken place, and, with distension so great, the removal of the septic debris would undoubtedly end fatally if done in the usual manner while the pathologic condition seemed to be limited. Delay with hope of the abscess discharging per rectum was warranted. The usual line of treatment for appendicitis was instituted, the patient going to the second week, when the symptoms of obstruction, extreme pain, vomiting and great distension developed, with a serious septic condition. I evacuated the abscess through the rectum, high up, puncturing the anterior wall into the cul-de-sac with a small trocar. This I knew to be unsurgical, but the symptoms were desperate and demanded instant relief. Twenty-two ounces of foul pus were removed in this manner, its pressure having caused retention of urine and obstruction of the bowels. It was followed by an amelioration of the symptoms for two days, when, after a good night's sleep, the patient awoke with the most intense suffering, severe septic symptoms and complete retention of urine, the abscess having refilled and the symptoms decidedly worse. Pulse was 120, temperature 97 to 98 degrees, tongue dry and cracked.

An operation was performed through the perineum, to drain the abscess in that manner, making the horseshoe incision of Kocher, beginning at a point midway between the tuber ischii and the anus, extending to the bulbous portion of the urethra and from there to a similar point on the opposite side, separating the fat of the ischial fossa, pushing the external hemorrhoidal nerve and artery back, the transversus perinei, with the bulbous portion of the urethra and the superficial transverse perineal muscles forward. The transverse incision of the fibers of the external sphicter at junction with bulbo-cavernus muscles was made and the division of the deep fascia transversely where it dips down to join the pelvc fascia, separating the levator ani muscles, reaching the prostate and continuing the dissection up back to the cul-de-sac. The abscess cavity was opened and nearly a quart of foul pus mixed with the liquid feces escaped. Washing with sterilized water and exploring with the finger, I found this

extensive cavity covered above by the intestines matted together, forming the upper abscess wall, with fundus at the caput coli. A drainage tube was inserted, and ordinary tamponing with iodoform gauze used. The pulse and temperature became normal, bowels moved six hours after the operation and patient's pain ceased immediately.

Subsequent history: Drainage was perfect, no further discharge after fourth day, no fever, no difficulty of bowel movements or bladder action. Temperature and pulse were normal five hours after the operation and distension disappeared immediately. Drainage tube was removed on the twelfth day. Wound granulated nicely. Patient fully recovered; out in third week.

In regard to the perineal operation for abscess of the appendix in this locality, the result was so satisfactory in this case that I have no hesitancy in advising the operation in case perforation and abscess formation takes place within the pelvis of the male, at the point described. In the female it is quite easy to reach an abscess of this kind requiring incision through the posterior cul-de-sac or between folds of broad ligaments, but in the male it is not so easily accomplished, yet can be done with perfect safety, and the great danger of causing general septic peritonitis and death by the usual operation can be avoided. The drainage being at the lowest point of the abscess, the intra-abdominal pressure completely evacuates it and the surgeon remains extra-peritoneal in all his procedures. The appendix could only be removed through the same incision if presenting and it would be impossible to take away more than the gangrenous portion. It is otherwise left to nature. The operator should have care not to break down the adhesions formed by the coils of the intestines forming the upper wall of the cavity, either by rough exploring or by too great force in washing it out.

The remarkable feature was the prompt closing of the perforation and healing of abscess, no fecal matter appearing after operation.

It might be asked if there was bulging of the perineum in this case that led me to incise here? While it was plain that fluctuation could be obtained by one finger high up in the rectum with counter pressure on the abdomen, not a sign of the collection could be obtained through the perineum and it seemed to those present that the proper method would be incision through the abdomen.

SURGICAL CLINIC IN GYNECOLOGY AT THE POST-GRADUATE SCHOOL OF CHICAGO, MARCH 7, 1898.

BY FRANKLIN H. MARTIN, M.D.,
PROFESSOR GYNECOLOGY,
ASSISTED BY F. A. BESLEY, M. D.,
INSTRUCTOR IN GYNECOLOGY.
CHICAGO, ILL.

[Stenographic report.]

Case 1.—The first case I have to present is one diagnosed fibro-myoma of the uterus. The patient is 45 years of age. She has borne no children. For several years there has been a menorrhagia developing, which lately has become excessive. Two suspicious symptoms about the case is the disproportionate loss of flesh in the last six months compared to the blood loss, and the almost universal fixation of the lower part of the tumor as I palpate it through the abdominal walls. It extends to just beneath the umbilicus. I should estimate the size of the tumor, including the uterus of which it seems a part, as eight inches in its long diameter, corresponding to the long diameter of the patient, and the transverse diameter at the largest portion at four inches.

Exploratory Laparotomy.—I will make an exploratory laparotomy with the idea of removing the tumor if that course seems practicable. The assistants have thoroughly scrubbed the skin of the abdomen, first with soap and water with a soft flesh brush (the skin having been previously prepared by the nurses), then have washed it thoroughly with 95 per cent. alcohol, then with 1 to 1000 bichlorid solution, and finally rinsed with hot sterilized solution. Sterilized towels are placed around the field of the operation.

We make an incision from two inches below the umbilicus to an inch above the pubes. On opening the peritoneum with an incision about three inches in length we find a large tumor of the uterus presenting, resembling a fibroid, covered in different areas of its free surface with papillomatous growths. This form of growth extends into both broad ligaments, and on both sides in the region of the broad ligament, the space between the uterine tumor proper and the sides of the pelvis is filled with this peculiar wart-like growth. It is obvious that it would be impracticable for any one to attempt to remove this uterine tumor with the complete fixation which exists as a result of this material. The papillæ extend onto the intestines, the mesentery and the omentum; they vary in size from that of an English walnut to that of a grain of mustard. The smaller ones resemble miliary tubercles. Without the microscope I will venture a diagnosis of adeno-carcinoma of the ovary with extensive direct continuity to the broad ligament and the fibroid uterus. The small piece of tissue that I secured on first opening the abdomen was immediately sent to the laboratory for examination.

Dr. Bethel, our pathologist, says, "I found it showed an adeno-carcinoma, papillomatous form."

I will close the abdominal wound without attempting the impossible—the removal of the tumor. Our prognosis must be of the most hopeless character. While the patient will probably recover from this exploratory operation, her lease of life will not extend, probably, beyond six months.

Case 2.—This woman is 37 years of age; married; has had three children, and two miscarriages. About three years ago she had an attack of peritonitis which followed "catching cold" after a miscarriage. This term catching cold is another term for infection. Infection, extending from vagina or cervix, which was present before the miscarriage occurred, or infection introduced by a careless obstetrician or midwife in attendance on the miscarriage, or it might have occurred as a result of the patient using a dirty douche point in attempting to cleanse herself after the miscarriage. Infection occurred and this was manifested by a high fever with rapid pulse, excessive pain in both sides in the region of the appendages, and considerable distention of the intestines.

This was undoubtedly caused by infectious material extending into the peritoneal cavity from the open ends of the Fallopian tubes. The immediate result of the leakage was a violent inflammation of the peritoneum at the point of infection. Fortunately, when this occurs at any point in the peritoneum the omentum, intestines and outlying peritoneum rushes in and attempts to limit the extension of the inflammatory action. This it ordinarily succeeds in accomplishing, and then the peritonitis remains local and runs its course in a few weeks, leaving the peritoneum with one or two pent-up pockets of pus. If this pus loses its virulence in the meantime, it may lie dormant for an indefinite time, and finally it becomes completely sterile. If the suppu-

ration is of a highly infectious character it will find an outlet through some of the adjacent organs, as the vagina, bladder, an intestine, or even the abdominal wall. In the case before us there is no history of an abscess having been discharged.

Symptoms.—This woman has been practically an invalid since her attack of ("inflammation of the bowels") peritonitis. She experiences excessive pain in the ovarian region almost constantly. The constant pain is of the character of pressure. Occasionally there are sharp acute pains in either side. She is never free from a severe backache. As menstruations approach the pressure symptoms and backache are greatly exaggerated. When the menstruation actually appears the woman suffers with excessive uterine cramp. As the flow is thoroughly established the pain becomes less. The woman, of late, has become excessively nervous. Her digestion is poor, and assimilation imperfect. She has headache, palpitation of heart, and frequently nervous spells in which it is with difficulty that she can control her will, and she becomes hysterical. These symptoms are all gradually increasing until she has become a despondent, suffering invalid.

Examination.—With the patient anesthetized, I proceed to make a bimanual examination with the finger of the left hand in the vagina and the right hand on the abdomen, I am able to palpate an irregular mass or tumor in the pelvis. With the cervix of the uterus fixed, I am able to trace what seems to be the uterus, about normal size, projecting backward into the Douglas cul-de-sac. From the sides of the uterus on both sides are large masses the size of a large orange on the right side, and of a smaller one on the left. Their large diameters, respectively, are three and a half and three inches. They are rather hard, but have the characteristic feel of tubal ovarian abscesses surrounded with adherent intestines. There are slight lines of demarkation between the masses and the uterus.

Operation.—From well-marked physical findings and symptoms, I am justified in performing a laparotomy. This I shall do with the idea of removing the diseased and destroyed appendages, and then fixing the uterus to the abdominal wall. As I incise the peritoneum the air rushes in and by that we can recognize the fact that we are in the abdomen. The intestines are full of gas, the patient not having been here long enough to be properly prepared. I immediately pack back the intestines with large gauze sponges, for three reasons: First, to keep them from being pinched or wounded during our manipulations; second, to protect them from any fluid which may escape during enucleation, in order that they may not become infected, and third, to protect them from being chilled because of exposure to the air of the room. With the bladder above, below and to the right we have a mass which seems almost inseparable from the intestines, and on the opposite side what seems to be a continuance of the mass.

The first thing to do is to locate the uterus, which is bound down in the posterior cul-de-sac and pracally covered up. I go back of where the uterus should be and with the fingers gradually advance, posteriorly, until I reach the cul-de-sac of Douglas, using an unusual amount of pressure, of necessity, with these strongly adherent tissues. I now have the uterus well in hand, and passing off to the right and left, will endeavor to enucleate the appendages. Going to the right and keeping well within the line of demarkation I gradually bring this large mass into view, but as I do so, because of its friability, it breaks and the fluid passes into the abdominal cavity and is absorbed by our protecting packs. In order that it will not gravitate beyond our packs into the abdomen we will lower the foot of the table a little. This enucleating is very difficult, and I can only liken it to the scooping out from the uterus of an adherent placenta.

We have finally brought up an infected mass, ovary, tube and broad ligament, from the right side, and from appearances it would not seem possible to successfully separate these tissues. I ligate the right broad ligament outside of this tumor deep enough to include the ovarian artery, in order to prevent excessive bleeding on this side. I now ligate off the tumor, which consists of a large cystic ovary filled with purulent matter, and a large adherent Fallopian tube. The ligature of catgut is made to include a pedicle near the right horn of the uterus. Now we start from the uterus again and pass off to the left side to begin enucleation of the appendages. It is almost impossible to get a starting point, and we must be careful not to penetrate an intestine. I have finally found a point from which I can begin my enucleation and am gradually getting the mass in hand and separating the adhesions. Here, posteriorly, is a large infected ovary and tube, very much like the opposite side, which accounts for the woman bearing no children since 1896. It is very seldom we see a double pyosalpinx so typically demonstrated. We tie off the mass the same as on the other side, including the round ligament here, in order to get a more stable pedicle.

I have the tube and ovary well up and will sever them close to the horn of the uterus, leaving nothing but the uterus. I disinfect the horn of the uterus thoroughly with strong bichlorid, and, before fixing the uterus to the abdominal wall, I will break up any further adhesions, getting a separation down into the cul-de-sac. I take a strip of tissue from the side of the wound, about three-fourths of an inch wide, and which contains the urachus, as a suspensory ligament for the uterus. With the uterus well up under the arch of the pubes I pass a Cleveland needle through its fundus, from behind forward, and draw the strip of tissue through this opening. Then, with a piece of catgut I secure the uterus to the peritoneal layer immediately above it, passing the catgut below the opening made by the Cleveland needle, which will act as a temporary stay until the uterus becomes fixed in the abdominal wall.

I have an enormous raw surface from which I enucleated these tissues, but adhesions of long standing bleed comparatively little, and there is less blood than you would expect. The peritoneum takes care of a large amount of blood and fluid of any kind if we can succeed in keeping it clean and antiseptic. I will put a glass tube into the cul-de-sac for the purpose of removing superabundant fluid and reducing the probability of infection to a minimum. You will be told by others, or read it in your books, that there is danger of the infection being carried from the exterior to the interior by means of the tube. This is impossible when the tube is properly cared for. We, who use the glass drainage tube, argue that it can do absolutely no harm when properly cared for. I have used it in hundreds of cases and no bad results followed,

and I know it may do an enormous amount of good. If you put in a tube, as a rule, the pulse will remain below 100, the skin will be moist, and you will have almost an ideal condition, simply because there is nothing left in the peritoneal cavity which can nurture bacteria, and without bacteria we can have no septic intoxication. The tube is dressed in one hour after the patient leaves the table. If there is less than two drams of fluid we increase the interval one hour, and continue to increase the interval one hour each time the wound is dressed if we get less than two drams, until we have increased the time to six hours, when, if we get very little fluid we will remove the tube. If, after the first two or three dressings, we get very little fluid the tube may be removed much earlier. In this case, we will probably be able to remove the tube by tomorrow morning.

I believe the results are better, in a case like this, to leave the uterus, when it is firmly fixed to the abdominal wall, than to remove it. I believe the bad results which frequently occur where the uterus is allowed to remain after the removal of diseased pus tubes are caused by the uterus being left in a retroverted position. If I should leave this uterus without fixing it forward, we would soon find it in retroversion, in which position it could easily become adherent, and we would have all the symptoms we usually get with a retroverted uterus. Ventral fixation of the uterus overcomes the objections, and we do not leave a vacuum, as when the uterus is removed, for the intestines to drop into.

In order that it shall not be necessary to open the whole wound in dressing the tube, place over the end of it a protecting dam, and this only will have to be opened when we dress the tube. The nurse who dresses it will take all the precautions to keep aseptic that she would in assisting at an operation.

Case 3.—Age 47; occupation, general housework. Family history: Mother died at age of 47; father died of tuberculosis; one brother and one sister living. Personal history: Menstruated when 14; always regular; never pregnant. Eight years ago she began to have trouble with her bladder, having pain when passing urine, which was worse at times; no other pelvic symptoms.

After a careful examination of this patient's pelvic organs, I find no displacement of the uterus or pathologic conditions of the pelvis, such as tumors or inflammatory swellings, which could give rise to bladder symptoms such as this woman complains of. By using a clean catheter and cleansing the external urethra the urine obtained from the bladder does not show pus. By palpation I can not discover any signs of urinary calculus. One can readily see that this is a pathologic condition existing at the meatus urinarius. The symptoms complained of by the patient, pain more or less constant and excessive smarting, discomfort after urinating, with a frequent desire to urinate, are referred to the external end of the urethra.

As a precaution I will make a cystoscopic examination with the Kelly instruments. The assistants will place the patient in exaggerated knee-chest position and hold her there. The external genitals have been thoroughly disinfected, and the external end of the urethra is likewise carefully cleaned. I measure the caliber of the urethra with the cone shaped calibrater and select a speculum which will pass into the urethra easily without undue stretching. This one is about one centimeter in diameter. I introduce the speculum, remove the obturator, and, by means of a hand mirror, reflect light into the bladder. As I withdraw this obturator from the speculum the bladder balloons and I can easily observe the blood vessels in the interior of the bladder, and its mucous membrane as far as I can see is normal. We have a beautiful picture of the normal net-work of blood vessels. The granulation appearing tissue, seen at the external meatus, extends about an inch into the canal. The family physician thought she had chronic cystitis. It looks much like carcinoma, but carcinoma of the urethra is very rare. I will remove a small portion and have it examined by the pathologist.

It is a very easy matter to dilate the urethra of the female when it is necessary with the index finger so one can make a thorough digital examination of the interior of the bladder. It can even be done by several sittings without an anesthetic. Here I am careful to dilate only the external portion and not carry the finger into the bladder so as to run the risk of infecting that. We will keep the urethra dilated for a few days, wash out the bladder with boracic acid solution, and wait for our report from the pathologist.

Professor Skene of Brooklyn, a distinct authority on diseases of the female bladder and urethra, says of neoplasms of the urethra: "These growths have been variously known as carunculæ, cellulo-vascular tumors, fleshy and vascular growths, fungoid excrescences, strawberry and rasberry tumors, each name sometimes having been used to cover the whole class." He makes a classification after Winckel's, which is as follows: Papillary condyloma, glandular cysts, myxadenoma, mucous polypi, vascular-angioma, varices, phlebectases, connective tissue fibroma, sarcoma, epithelial-epithelioma, carcinoma, compound papillary polypoid angioma, erectile tumors.

Case 4.—Age 61; German. Family history: Parents dead; one brother living; eight brothers and one sister dead; brothers died in early childhood. Personal history: Has borne eleven children; seven living; labors natural. Health good until two months ago she noticed left breast enlarged and painful. Has been able to attend to her work since then. Nothing hereditary in the family so far as known.

There is a tumor of the left breast, the diameter of which I estimate to be three by four inches. From the fact that Billroth, out of 440 tumors of the breast, found only 18 per cent. non-malignant, we are justified in looking upon a breast tumor as a grave matter. Now, when we take into consideration that sarcoma of the mammary gland is rare compared to carcinoma, and that it is more frequently met with in young women, we are inclined to look upon this as a carcinoma, if it is malignant at all, rather than sarcoma.

This tumor is irregular and movable, has begun to involve the skin, but has not involved the chest muscles or chest wall. On one portion of the surface we can trace a line of infected lymphatic glands, and there is marked contraction of the nipple. These are both characteristic signs of carcinoma, as distinguished from sarcoma. There is severe and almost continuous pain, while in sarcoma there is rarely severe pain. Upon examining the glands of the axilla I find them enlarged. One especially is large. The lymphatic glands are rarely infected in sarcoma. We can readily eliminate an inflammatory swelling as the cause of this tumor. Its nodular conditions and density eliminates a fatty tumor. Our diagnosis then is carcinoma of the breast with involvement of the axillary glands.

I consider no rule which can be more safely followed in well defined tumors of the breast than to always remove them. I proceed with the operation

by making an incision from the axillary space along the border of the pectoralis major muscle toward the sternum in such a manner as to make one side of it, near the center of the breast, include an elliptical piece of skin surrounding the nipple. The skin over the center of the breast, as far as involved, I seek to include in the tissue to remove. I now remove the mammary gland, entire, including the tumor, keeping as far away from the indurated tissue as possible until I have removed the whole mass, and then follow carefully my dissection into the axillary space, and, with extreme care, I remove all loose connective tissue, fat, and several well-marked, enlarged, lymphatic glands.

I now feel that I have done all that is possible to do with any certainty of benefiting the patient. All bleeding points were caught in artery forceps by my assistants as rapidly as exposed. I now twist or tie these points according to their importance, using catgut for tying. I now close the wound with interrupted silk-worm gut sutures. I place a short rubber drainage tube in the axilla so as to drain the lower angle of the extensive wound. After tying the sutures, a liberal dressing of absorbent gauze is placed over it and the tissues still further supported with adhesive straps.

The pathologist reports that the growth is carcinoma.

AN EPIDEMIC, SEPTICEMIC DISEASE AMONG FROGS DUE TO THE BACILLUS HYDROPHILUS FUSCUS.

FROM THE PATHOLOGIC LABORATORY OF RUSH MEDICAL COLLEGE. CHICAGO.

Presented before the Chicago Pathological Society, April 11, 1898.

BY FRANK HORACE RUSSELL, A.B.

During the last half century or more science has made an extensive use of frogs in her laboratories: they have been used to demonstrate the laws and facts of biology; to ascertain the presence and effect of a variety of poisons; to show the circulation of the blood and the nature of the processes of inflammation; to contrast the action of different currents of electricity upon the muscles; to demonstrate the action of curara in destroying the properties of motor nerves. Notwithstanding the close observation to which this laboratory animal has been subjected during recent years, observers have rarely found in it evidence of disease.

In 1891 Sanarelli described and named the organism under consideration. He discovered it while performing some inoculation experiments upon frogs. They accidentally became infected and death soon resulted and this so seriously interfered with his work that he was lead to investigate the cause, isolated the bacillus and described the growth of the cultures on plates, glycerin-agar, agar-agar, gelatin, serum, blood serum, and potato. The cold-blooded animals for which the micro-organism was pathogenic were frogs, toads, salamanders, lizards, sunfish and fresh-water eels. Among the warm-blooded animals which died of the infection were guinea-pigs, rabbits, new-born dogs, new-born cats, mice, field mice, chickens and pigeons. The source of the bacillus Sanarelli claims to be in water. Out of twenty-six water-supplies which he examined he found it present in two.

In 1893 the attention of Trambusti was called to this organism because of an extraordinary mortality among the frogs in the laboratory in which he was experimenting. He identified it with that described by Sanarelli. His investigations in this direction had mainly to do with the physiologic action of the toxic products of the micro-organism upon frogs. He divided his experiments into three lines: 1. The action of the pure culture. 2. The action of those substances soluble in alcohol. 3. The action of those substances insoluble in alcohol. Besides this he investigated the chemic reaction of the muscles, brain and spinal cord of the frog after the injection of the toxic products of the organism.

During the same year the organism was discovered and identified by Rogers. His attention was directed to it because of the death of frogs in the laboratory after the introduction of a fresh lot.

During October 1897 an epidemic broke out among the frogs kept for experimental purposes at the laboratory of Rush Medical College, and was so remarkable as to demand special attention. The frog tank is a zinc-lined box through which a continuous stream of hydrant water flows. In the bottom were placed some porous rocks of various sizes upon which the frogs could perch and the outlet of the tank so placed that about three inches of water continually remained in the tank. At the beginning of the school year a new supply of sixty frogs was put into the tank along with eighteen which had been kept over from the preceding year. In a short time they began to die and during six days about seventy perished, while not many days passed before the remaining ones died. The tank was then thoroughly sterilized, the sharp-cornered rocks replaced by boxes of sand, and a new lot of frogs put in. A few of these died, but by removing the affected ones as soon as any symptoms developed the remaining ones have been fairly well protected.

The symptoms following infection commenced with a disinclination to move. When touched on the end of the nose there was not the customary response. Along with this lassitude there was swelling of the abdomen, which varied some what as to degree. There was also more or less change in color. The dark greenish hue faded to a greenish-yellow tinge; especially was this marked around the black spots on the back. The change in posture was noticeable. The animal changed from a semi-erect position to a horizontal. The head was not held up but carried on the same level as the body. Rather late in the infection the legs were thrown out from the body. The fore legs had their palmar surfaces directed outward. The hind legs took a position about at right angles to the body. When urged the frog did not jump but tried to get along by a creeping movement. During this stage swimming was difficult. Shortly before death muscular contractions were observed, during which the hind legs were thrown as far forward as the head. These spasms were of short duration but recurred. Toward the end of the disease there was coma and during this stage all outward signs of life disappeared. The body showed no regidity and remained in any position in which it was placed. When the thorax was cut open the heart was found still beating.

At least sixty frogs were examined postmortem. All of these presented practically the same lesion whether infected spontaneously or inoculated with cultures.

In making the examination the following precau-

tions were taken: To prevent contamination all instruments were sterilized with heat. As each cavity was opened inoculations were made on various media and at the same time cover-slip preparations were made. Each organ was examined in the same way. Cultures were made upon the different kinds of media but in addition to this, provision was made to grow the organism in the absence of oxygen. The tissues from all the organs and from the muscles were preserved for sectioning. The hardening fluids used were alcohol, corrosive sublimate, formalin and Mueller's fluid.

The following is a résumé of the most important findings in the examination of the dead bodies: The tongue in most cases had hemorrhagic spots upon its upper surface. The muscles, especially those of the thigh, contained more or less infiltration of blood. The appearances varied considerably; sometimes there were only a few spots which were large in size, one was observed which was nearly the size of a pea, sometimes the points of hemorrhage were very small and thickly set. In this form all the muscles of the legs and abdomen were involved and distinctly red in color. The abdomen was distended. An incision revealed a serous blood-stained fluid, found subcutaneously and in

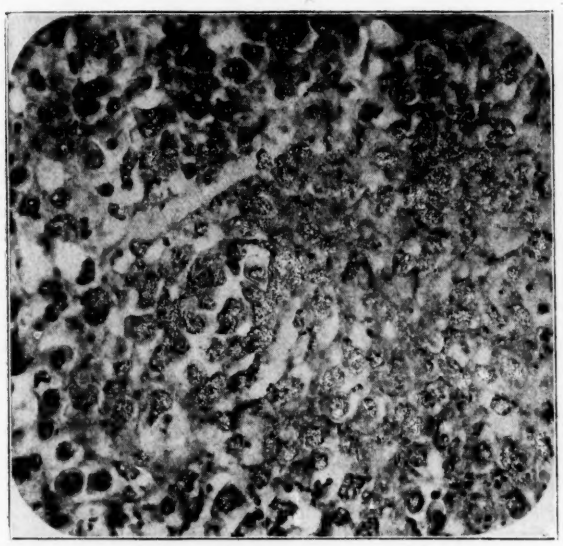

Fig. 1.—Necrosis in spleen of a frog. Stained with hematoxylin and eosin (x 200).

all the cavities of the body. In quantity this was relatively large, especially in the abdominal cavity. The lungs were sometimes distended with air but more often collapsed. The heart muscle was pale and flabby. The stomach and intestines were markedly distended. The blood vessels on their surface were much congested. Upon opening these viscera a large amount of jelly-like material was seen. The spleen was soft and contained considerable blood, the liver dark brown in color and of a mottled appearance. It was soft in consistence. The gall bladder contained considerable greenish-yellow fluid. The kidneys were negative. In the bacteriologic examination, cultures were obtained from all the organs and cavities of the body Cover-class preparations showed a large number of bacteria. The organism was a bacillus (Fig. 3), in shape short and thick with rounded ends. It appeared at times almost egg-shape. Its size in the cultures varied greatly according to age. When examined from the fluids of the body the characteristic appearance was in twos joined together end to end. Occasionally bacilli appeared isolated and at times short chains were seen, and sometimes a number are clumped together.

CULTURES ON DIFFERENT MEDIA.

1. *Agar-agar plates, twenty-four hours old.*—In shape the colonies are round, edges well defined, and regular with a few indentations about the periphery. Usually a dark spot appears in the center. The culture as a whole presents a granular appearance. In color it has a slight bluish tinge when viewed with the unaided eye. Under the low power of the microscope it is yellowish. On the second or third day a ring appears about midway between the central dark spot and the periphery, which encloses a darker colored area.

2. *Plates on gelatin, twenty-four hours old.*—The colonies are yellowish in color and uniformly granular, the edges well defined but a little ragged. After the second day they can not be studied to any advantage because the gelatin is liquefied.

3. *Cultures on agar-agar slants.*—The organism grows rapidly on this medium appearing first in three or four hours as a whitish gray line along the streak of the needle. The edges often show round colonies which possess a pearl-like glistening. In its growth it becomes raised above the surface of the medium and spreads slowly from side to side. In two or three days it turns to a dirty gray, gradually changing to a dark amber color which becomes more pronounced with age. This amber color is not only present in the cultures but also becomes diffused through the medium. There is a radiating appearance to the culture with a narrow zone about the edge which is light in color.

4. *Blood serum.*— Examined after twenty-four hours it shows an ash gray color. The growth is quite spreading with undulating edges. In the bottom of the tube is a quantity of fluid due to the liquefaction of the media. This is cloudy, resembling the growth in bouillon. The growth on the slant stops at the edge of the fluid. After forty-eight hours the liquefaction is increased. The growth looks milky and is partly undermined at the edges.

5. *Glucose agar* to which has been added from two to three drops of glycerin and inoculated on the slant shows a spreading diffuse growth. After about twelve hours a slight blue fluorescence appears, which again disappears in about two days.

6. *Glucose agar, stab culture, twenty-four hours old.*—On the top there is a growth about the point of puncture. Along the track of the needle and branching from each side are many gas bubbles.

7. *Bouillon, twenty-four hours old.*—The fluid is diffusely clouded. When shaken slightly it is seen to contain a grayish-white sediment which looks like rolling clouds. In the bottom there is quite a collection of the same material. A characteristic odor is present which is a combination of two odors, a slightly fetid and an aromatic odor.

8. *Glycerin agar, twenty-four hours old.*—Here a white line appears along the track of the needle. The growth does not tend to spread much. There is a slight bluish flourescence at the edges. The growth is slow and does not turn dark, as is the case on the agar-agar. The color of the media remains unchanged.

9. *Litmus milk, twenty-four hours old.*—Nearly the whole of the contents of the tube is coagulated.

The color is light purple. After forty-eight hours the coagulum has become much firmer and reduced in size until fluid and coagulum are about equal in quantity. The color of the fluid now becomes cherry-red.

10. *Gelatin stab, twenty-four hours old.*—A grayish-white growth appears along the whole path of the needle. At the top there is a depression of liquefaction about the size of a pepper seed. Gas bubbles often appear along the needle track. At forty-eight hours there is liquefaction at the top, the size of a pea, with more or less liquefaction along the whole needle track. In about four days liquefaction is complete.

11. *Potato, twenty-four hours old.*—The growth when turned toward the light is glistening. At first it is straw-colored; if any portion of the potato is somewhat dry, the growth here is orange yellow. It does not show much tendency to spread. The outer edge is irregular. Many raised points can be seen resembling blebs. Examined forty-eight hours after inoculation it has a dirty appearance. The blebs become more prominent. On the fourth day the growth begins to take on a chocolate color which resembles the growth of the bacillus of glanders.[1] The brown color becomes more marked with age.

Cultures do not die readily. They will live at least five months upon media without being transplanted.

LETHAL TEMPERATURE.

The bacteria are killed by a temperature of 50 degrees C. in from five to eight minutes. The method employed to determine the point of thermal death was as follows: A bouillon culture was put into small sealed glass tubes. These were put into water maintained at a temperature of 50 degrees C. At different intervals these were removed, broken open and inoculations made into media. Five minutes at this temperature greatly retarded the growth and eight minutes was sufficient to kill them. Cold will not kill them. After being exposed for seventeen hours at a temperature of —20 degrees C. they still grew when put into the incubator, though their growth was greatly impeded.

MOTILITY.

The organism examined by means of the hanging drop exhibits active motility. It has the power of both backward and forward motion. If its movements are watched, frequently it will be observed to start in a certain direction, stop suddenly, and without turning to go in exactly the opposite direction.

REACTION TO STAINS.

It does not stain by Gram's method, but takes the other common stains readily. Methylene blue makes a very distinct and convenient stain. For blood preparations a simple and easy process of staining is by the use of eosin and methylene blue. The red blood cell is stained light green, the nuclei of the red and the white blood corpuscles together with the bacteria are stained blue.

Another method used for studying the action of the bacteria in the blood is the following. A staining solution is made by adding methylene blue to a physiologic salt solution to the point of losing its translucency. A wall of vaselin is made on the slide inclosing an area somewhat smaller than the cover-glass and into this a little fresh blood is put with two or three drops of the staining solution. The cover-glass is put on and the preparation examined under the immersion lens. The blue readily stains the bacteria, the leucocytes and the nuclei of the red blood corpuscles. The bacteria can be seen moving in the midst of the corpuscles. Some are isolated and move rapidly; others show chain formation and are sluggish. Occasionally a leucocyte is broken down and is seen to contain bacteria.

[1] This is easily differentiated from glanders by the use of a saturated solution of mercuric chlorid. A few drops added to the culture turns the bacillus of glanders to a bluish-green color which persists several days. A few drops of the solution added to the bacillus hydrophilus fuscus turns it to a milky-white color. In the latter the original color returns after a short time.

FLAGELLA.

Flagella (Fig. 4) were demonstrated by the use of a modification of Loeffler's method of staining. Cultures on agar four or five hours old gave the best results. The older bacilli do not show any flagella. A platinum wire was flattened out for the purpose of touching the culture without getting any of the media. This wire was then introduced into a small quantity of distilled water when a string of bacteria could be observed leaving the needle. A very fine capillary tube was then filled with this water containing bacteria and very fine drops placed on a slide previously cleansed with alcohol and acid and then heated to a redness. When dry the slide was fixed in the flame in the ordinary way. The mordant was applied and the slide held high above the flame (no alkaline or acid solutions were used). After steaming the slide was washed with distilled water and then alcohol. Carbol-fuchsin was then added and heated to the point of steaming. The slide was then washed, dried and mounted. By this method it was ascertained that the organism has but one flagellum. This is attached to one end. It appears wavy and is from four to six times the length of a bacillus.

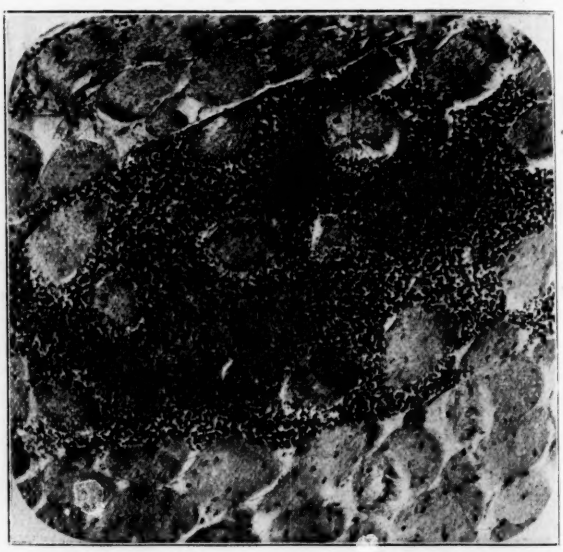

Fig. 2.—Intermuscular hemorrhage in the thigh of a frog (x 200).

INOCULATION EXPERIMENTS.

1. Frogs were inoculated in the thigh, in the peritoneum and in the lymph sac on the back. They gave no symptoms additional to those already given in describing the epidemic disease, except occasionally after inoculation a frog would have a paroxysm of coughing during which a frothy fluid would come from his mouth. After these inoculations with virulent cultures death ensued in from eight to sixteen hours.

2. The rabbit was inoculated into the ear vein; this produced death in a little over two days. The inoculated ear was enormously swollen and drooped to the floor. Upon examination no exudate was found subcutaneously; a slight amount of blood-stained fluid was in the abdominal cavity, also in the pleural cavity. The heart contained much darkly colored blood; the liver, spleen and kidneys were congested; the stomach and intestines were distended with gas; the bladder was full of urine; the lungs were normal. Muscular hemorrhages were not noticeable. One of the rabbits that was used had been made immune to pus microbes. It was inoculated in the abdominal cavity, also in the vein of the ear. Each time it became sick but resisted the infection.

3. The guinea pig was inoculated in the abdominal cavity. In about an hour it had a severe chill; in another hour it became restless, breathed rapidly and showed evidences of fever; in three or four hours after inoculation it became very weak and continued in a state of prostration until death, which occurred eight hours after inoculation. The internal lesions were practically the same as in the rabbit.

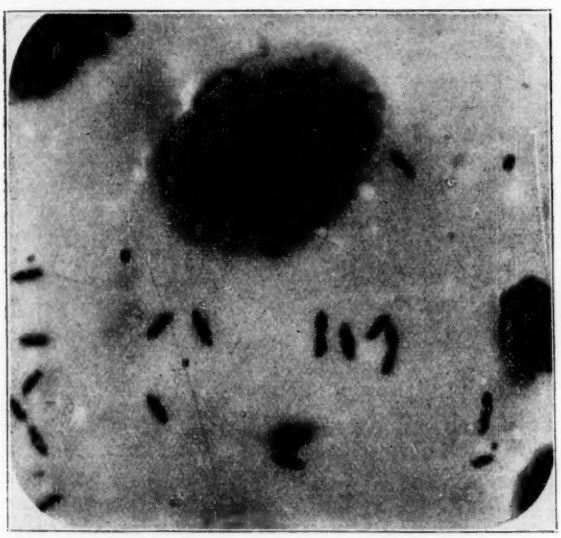

Fig. 3.—Bacilli in blood of frog. Stained with methylene blue (x 1200).

4. The house mouse was inoculated in the abdominal cavity with a culture from agar-agar shaken up with a little bouillon. Soon after inoculation the mouse became very restless, ran about the cage and scratched itself. Later it shivered and soon went into a prostrate condition and died two hours after inoculation.

5. The white rat died five hours after inoculation. The symptoms were shivering, bristling of the hairs, and later prostration.

6. Two different pigeons were tried. They were inoculated in the breast and the axillary veins. They became sick after each inoculation but resisted death.

EXAMINATION OF THE TISSUES MICROSCOPICALLY.

1. Frog.—The tissues were stained with hematoxylon and eosin and with methylene blue. The spleen shows evidences of marked congestion. Through the organs there are areas of retrograde changes and areas of congestion: *a*. The areas of retrograde changes differ much in size and shape and are always irregular. The groundwork consists of a granular eosin-staining material not uniform in thickness. Around the heavier staining material are spaces of less density. This groundwork is thickly studded with hematoxylon staining material, especially where the groundwork is less dense. This hematoxylon staining material, including nuclei and their fragments, exhibits a great variety of forms and staining properties. There are lightly staining nuclei more or less enlarged. The outline stains dark and the center light. Within the nucleus the chromatin is collected in granules which have a tendency to collect in bunches around the periphery. Although these nuclei in places are regular and round in outline, they are mostly irregular and abnormally shaped. They assume a large variety of shapes, pear shape, dumb-bell shape, crescent shape, K shape, spiral shape. Some are ragged in appearance where one side of the nucleus has disappeared. Another variety of nuclear substance is bodies which stain very deeply with hematoxylon, homogeneous in character, resembling a fused mass. In size they vary from those just visible to the size of a red blood corpuscle. They are globular in shape. Resembling these globular bodies are oblong bodies, but which do not show the difference in size. They have a tendency to mass and sometimes are arranged slightly star shape. Another variety is irregularly shaped dark granules. These do not stain evenly, are accumulations of granules of chromatin, very ragged in outline and joined together in many ways, not infrequently cauliflower in shape. In these areas of nuclear fragmentation a few isolated red corpuscles appear. Some fields contain more than others, but they are comparatively few. Many of the corpuscles are distorted in shape (Fig 1). Sections stained with methylene blue show that these fields contain many bacilli, frequently distributed in clumps. Stained with Weigert's fibrin stain, minute bands of fibrin run in all directions inclosing the nuclear granules in a delicate network. In the necrotic areas there are many hematoidin crystals, appearing as isolated single crystals and also collected in masses. *b*. The congested areas.—The congestion in these areas is intense. So compact are the blood corpuscles that no spleen structure can be seen except at the edges of the areas. Here the blood fills the lymph spaces and infiltrates the tissues.

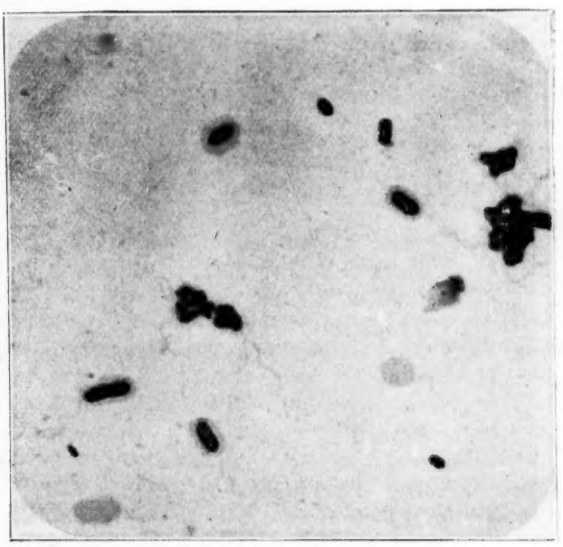

Fig. 4.—Flagella (x 1200).

The muscles present changes of interest. Those of

the thigh were examined. In looking at a cross section a number of areas are observed showing retrograde changes in the muscular fibers. These are always accompanied with hemorrhage. The changes in the fibers are of two varieties: *a*. Through compression.—In the densly congested areas the muscular fibers undergo pressure atrophy. Some have become so small that only a delicate band is left. These may show further retrograde changes or may not. *b*. Degeneration.—The changes seen are the separation of the fasciculi from one another, accompanied by a wavy appearance. The crossed striæ disappear. The fibers refuse the eosin stain and are dark yellow in color. Subsequently the nucleus disappears and there remains only a mass of granular débris. Fibers are then seen in all stages of degeneration. An individual fiber may be observed in which a part may be undergoing a retrograde change and the remainder be little affected (Fig. 2).

The lungs and kidneys show little or no change.

In the liver marked changes occur. The retrograde process is of a diffuse character in which the whole liver participates. In comparing this with the normal liver one of the first things to be noticed is the difference in staining property manifested by the cells. In the place of the protoplasm taking the eosin stain exclusively, as in the normal liver, it takes the mixed stain. The cell bodies do not stain evenly. The protoplasm has the apprarance of a bunching of granular material so that some parts of the cells are denser than others. This often affects the contour of the cell; the edges are often irregular and ragged; sometimes no distinct cell outline can be seen at all; sometimes the outline of the cell stains rather deeply while the center shows little remaining cell matter and the nucleus, if it has one, appears free. In the protoplasm of the cell are many darkly stained granules. In a single cell there are from one to eight or ten. These differ in size from those barely visible to those one-tenth the size of a normal nucleus. They do not occupy any special place in the cell. The nuclei of the cells show all stages of degeneration. They have suffered far less, however, than the cell bodies. Some of the nuclei appear bladder-like and contain little chromatin, others show a mass-like accumulation of chromate granules about the edges, often located almost exclusively on one side. The nucleus frequently loses its round contour and becomes elongated, assuming many shapes. In some of the cells the nuclear membrane has disappeared leaving an irregular mass of chromatin granules. The capillaries are dilated and contain considerable blood, together with cell detritus and fragmented nuclei. The walls of the capillaries are broken in many places and the blood corpuscles have escaped among the cells. Bacteria are found in abundance in the capillaries, appearing usually in bunches and often occupying many of the broken down cells.

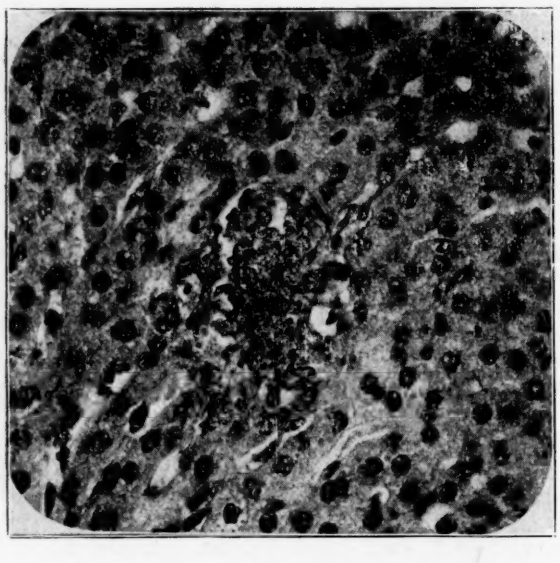

Fig. 5.—Focal necrosis in the liver of a guinea pig (x 200).

Cross sections of the spinal cord and brain show that these organs do not escape the destructive action of these agents. Quite extensive necroses occur in both places. When sections are stained with mythylene blue bacteria appear in abundance in these tissues. The minute study of the lesions and effects of the toxins on the nervous system will be deferred to a subsequent time.

In frogs, where infection has lasted several days the lymph sac on the back shows great changes (it is here that inoculations were made). In the recent state the sac is quite well filled with jelly-like material. In character it is a rather soft, semi-transparent mass which can easily be squeezed between the thumb and finger.

Microscopic sections show that these growths are attached to the inner surface of the skin. They appear pedunculated. A cross section of one of these masses shows a dark center and a light periphery. Blood vessels are present. The vessel walls are thin and lined with flat endothelial cells. With high power the dark center is seen to be made up of a large aggregation of nuclei and nuclear fragments, mostly the latter. There are dark granules which are round, oblong and irregular, together with a great number of very fine granules. Mixed up in this mass of broken down nuclei are a few red blood corpuscles, many leucocytes and a few lightly staining nuclei distorted into many shapes.

The periphery shows a somewhat reticulated structure which to some extent enters into the formation of the dark center described. In this eosin staining groundwork are a few blood cells with a few nuclei and granules.

Fibrin is present in these structures, as is shown by Weigert's fibrin stain.

2. Guinea pig. The tissues of the guinea pig show evidences of an infection, although the time between the inoculation and death was only eight hours. The spleen and the liver contain most of the changes. The muscles, testicles, lungs and heart do not present any marked pathologic conditions. *a*. In the spleen a strong contrast exists between the Malpighian corpuscles and the spleen pulp on account of the large amount of blood in the latter. In looking over the specimen with the low power many dark spots appear scattered through the pulp. These areas are relatively small, contain a granular center and are full of bacteria. Surrounding this there is quite an extensive zone consisting of leucocytes more or less broken down, and nuclear fragments. The pulp is everywhere greatly congested with blood. The Malpighian corpuscles show no changes. *b*. The liver also shows many focal necroses. These do not choose any special part of the lobule by preference. They are mostly small in size, some so minute as to occupy only one liver cell. The central part is finely granular and stains darker than the liver cells. In the process of

disintegration the cell body seems to show the first change, which is a granular appearance. The outline becomes irregular and ragged. The chromatin of the nucleus, which soon shows changes, collects at the periphery in masses. Frequently it is nearly all on one side. The circle becomes broken and the nucleus as such disappears. The cells through the liver have a more or less granular appearance. The edges are not easily made out and their nuclei do not stain evenly. The capillaries are dilated and contain many cell fragments and granular material.

3. Rat. *a.* Liver.—In looking over the specimen one of the first things to attract attention is the large number of leucocytes which it contains. These are often gathered in masses. The liver cells contiguous to this round cell infiltration may or may not be affected. In not a few places the liver cells have undergone disintegration. Away from these areas the liver cells do not show any particular change except

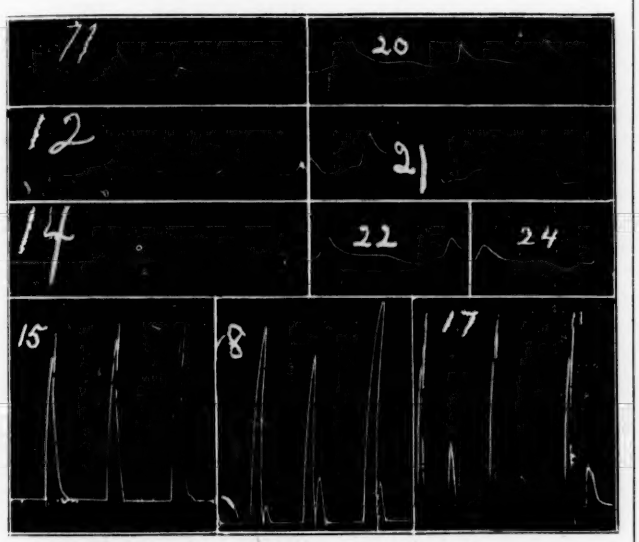

Fig. 6.—20, tracing with the cardiograph of the frog's normal heart beat. 21, five minutes after injection of toxins insoluble in alcohol. 22, fifteen minutes after injection of toxins insoluble in alcohol. 24, thirty minutes after injection of toxins insoluble in alcohol. 15, contraction of normal gastrocnemius muscles. 18, gastrocnemius muscle one half hour after injection of toxins insoluble in alcohol. 11, tracing of normal heart. 12, ten minutes after injection of toxins soluble in alcohol. 14, thirty minutes after injection of toxins soluble in alcohol. 17, gastrocnemius muscle thirty minutes after injection of toxins soluble in alcohol.

the granular appearance of its protoplasm. *b.* Spleen.—The most noticeable feature is the congestion. The Malpighian corpuscles appear very prominent. The lymph spaces are greatly crowded with blood. In a few of the Malpighian corpuscles some infiltration has taken place. In a few areas there is cell fragmentation about the edges of the Malpighian corpuscles. In them we see lymph cells which stain lighter than usual. They have lost their normal shape and many appear vacuolated. Nuclear fragments and bacteria are found in large numbers in these areas. *c.* Kidney.—No marked changes are to be seen except in the veins and convoluted tubules. In some of the large veins there can be seen breaks in the walls. Here the blood infiltrates the tissues, accompanied with a dissolution of the contiguous tubules. At the junction of the vein with the tissues there are fragmented nuclei. Some of the nuclei of the vein can be seen free, still retaining their natural shape. The lumina of some of the convoluted tubules are very irregular and ragged. *d.* The muscles, stomach and heart muscles show no change. *e.* The lungs show no changes except a moderate congestion.

4. Rabbit. *a.* The spleen shows much congestion. In the pulp a large amount of hematoidin crystals exist, isolated and in masses. The Malpighian corpuscles show little change and are not infiltrated to any extent. There are no focal necroses. *b.* Many of the liver cells appear rather narrow, surrounded by distended capillaries filled with blood. They are granular in appearance. In places much of the cell body has left the nucleus, leaving it almost and sometimes quite free. Some of the nuclei have assumed abnormal shapes. The capillaries contain protoplasmic and nuclear material mixed in with the blood. Liver cell nuclei, having more or less surrounding protoplasm, can be seen distinctly in the lumina of the capillaries. In many of the large veins and in many of the central veins of the lobules can be seen free bodies consisting of eosin staining material in which are mixed darkly staining granules. There are no areas of round cell infiltration. Throughout the specimen are scattered a large number of hematoidin crystals. *c.* In the kidney the convoluted tubules show granular changes and stain irregularly. The lumen contains granular material, epithelial cells and nuclear fragments. There are no focal necroses and very little congestion. *d.* The muscles and stomach show no changes. *e.* In the brain the most noticeable thing is the congestion of the blood vessels.

5. Mouse. *a.* The liver shows focal necroses which answer in description to those found in the liver of the guinea pig. The liver cells are granular. Many of the nuclei have lost their shape and show different forms. In the capillaries there are cell fragments consisting of cell protoplasm and nuclear granules. Small masses are present in the large vessel as was described in the liver of the rabbit. When stained with methylene blue bacteria appear in large number in the capillaries. *b.* The testicles, epididymis and heart muscle are negative. *c.* The kidney is very similar to that described in the rabbit.

A fact to be noted in the examination of the tissues is the relation of the virulency of the organism to the focal necroses. As a culture grows old it becomes less virulent. Virulency is best retained in blood taken from the heart and kept in sealed tubes. When a culture which is two months old or more is injected into the frog, sickness is produced which rarely results in death. Thus different grades of virulency can be observed. If after an inoculation with a culture attenuated by age a frog survives two days or more, no focal necrosis may be expected. The congestion in the organs remains about the same, except less marked. The exudation into the serous cavities is also less noticeable. This same relation between the degree of virulency and the amount of lesion holds true with the warm-blooded animals. The greater the virulency the greater the amount of necroses.

As to the mode of infection nothing definite can be stated. If bacteria are put into water and into this is introduced a frog having a cutaneous lesion, infection will take place. Several times frogs which supposedly had no cutaneous erosions were put into infected water and only one died. In this case it would be impossible to prove that no lesion of the skin existed. Bouillon cultures of the organism on several different occasions were introduced into the stomach by means of a glass tube, but with no apparent effect. It seems very probable, therefore, that the sharp-cornered rocks

in the frog tank had much to do with the original epidemic. The frogs gliding over these sharp projections could easily sustain injury of sufficient extent to admit of the entrance of the bacteria.

The source of the bacillus is yet an open question. During the epidemic, bacteria were found in great numbers in the water of the frog tank. It has been ascertained also that a frog inoculated with the bacillus will infect the water. It is evident, therefore, that there might be two ways to explain the source of the organism. The bacteria might be in the Chicago water or they might come with the frogs. The tap water has been examined several times with negative results. A frog, in which was kept an open wound, was put into running water and retained there for two weeks. No infection took place. It is most probable, therefore, that the bacteria came with the frogs.

Widal's test was performed on two different occasions. Frogs were used which were at the point of death. The serum was diluted thirty times and no agglutination took place. With five to ten dilutions there was agglutination, which after a few hours in a warm place disappeared. At another time forty dilutions were made with no clumping of the bacteria.

TOXINS.

In order to test the toxins a culture of bouillon was placed in the incubator at a temperature of 37 degrees C. and left to grow for three weeks. This was then filtered through a Chamberlain's filter. When 2 c.c. of this filtered fluid was injected into the lymph sac of the frog no effect whatever was produced.

Dead bacteria were also injected into a frog. This produced some indisposition which was shortly recovered from.

This filtered bouillon culture (following Trambusti's method) was subjected to farther processes in order to get the toxins in a more concentrated form. To about 115 c.c. of this fluid 290 c.c. of absolute alcohol were added. With occasional shaking the alcohol was left in contact about two days. Then this mixture was filtered through two thicknesses of filter-paper. The filter-paper was then dried and washed with 22 c.c. of distilled water. This constitutes the toxins which are insoluble in alcohol. The fluid which passed through the filter was evaporated in a water bath. Then 30 c.c. of absolute alcohol were added to the residue so as to precipitate all the toxins which were not soluble in absolute alcohol. This was filtered and the filtrate evaporated a second time. This last residue was then dissolved in 15 c.c. of distilled water. Thus two classes of toxins were obtained, those which are insoluble in alcohol and those which are soluble. When these toxins are injected into frogs marked effects are produced.

1. *Toxins which are insoluble in alcohol.*—A frog was prepared in the usual manner and a tracing of its normal heart taken by the cardiograph (Fig. 6). Then 1 c.c. of the solution of the toxin was injected into the lymph sac of the thigh and also into the peritoneal cavity. Five minutes after injection a tracing was taken (Fig. 6). The horizontal distance through which the lever moved was twice that of the normal. Diastole was prolonged. The tracings also show a retarded action. The following table shows the number of beats per minute taken at different times subsequent to the injection:

Time.	No. beats.
11:17	35
11:25	31
11:46	28
1:01	22
1:07	17
1:12	heart stopped in diastole 4 or 5 minutes.
1:27	5

About two hours after injection the action of the heart became peculiar. It would stop in diastole for four or five minutes. Then it would begin to beat again. The rate was slow, being only five to eight times per minute. After six to thirteen beats it would again stop in the same way. Although the rate was very slow, every beat was forceful, The ventricle contracted so firmly as to become white.

Tracings made by means of the myograph on the gastrocnemius muscle showed changes which can best be seen by comparing Figs. 15 and 18. A short curve appears immediately after the long curve; then a straight line follows until the next long curve.

2. *Toxins soluble in alcohol.*—The frog was prepared and treated in the same way as already described (Fig. 11). Ten minutes after injection there was no variation in the curve except it was stronger (Fig. 12). The rapidity of the heart was the same. Thirty minutes after injection the action of the heart was so feeble that practically a straight line was obtained by the cardiograph (Fig. 14). Thirty minutes after injection the gastrocnemius muscle showed a decided variation from normal (Fig. 17). The down stroke of the major curve is continued below the basement line, then arises a little above it and falls again to the basement line. Half way between the major curves is a short curve. Thus we have two toxins produced by this organism, each having a powerful effect upon both the voluntary and involuntary muscle. (A more extended study of the toxins in connection with the nervous system is reserved for a later date.)

It is quite evident that the cause of our epidemic in the frog pond is identical with that described by Sanarelli, Trambusti and Rogers. Our experiments have very similar conclusions to theirs, but a few things have been added. In looking over the literature there is no record of necroses observed in the organs, the flagella had not been studied, the thermal death-point had not been ascertained, and no observations had been noted in relation to the degrees of virulence. Two differences are to be noted between Sanarelli's organism and ours: we fail to get gas bubbles in the substance of the media after inoculating a slant of glycerin-agar, unless the needle penetrated it. Another difference is in the inoculation experiments with the pigeon. Here infection by an intravenous injection produced sickness from which the pigeon recovered on the second day; in his case it died.

To sum up, we have been studying a water organism, a short thick bacillus with rounded ends, which possesses active motility and has but one flagellum, is chromogenic, gas-producing and aerobic, but grows also to some degree without oxygen. It grows well upon all culture-media. Gelatin is liquefied, bouillon diffusely clouded, upon agar-agar there is produced in a few days an amber color which also colors the media, potato produces a chocolate-colored growth, litmus-milk is made acid, glycerin agar produces an ash-white growth but does not change in color and glucose-agar shows gas formation. It grows best at body temperature and does not stain by Gram's method. The cold-blooded animals for which it is

pathogenic are frogs, toads, salamanders, lizards, sunfish, and fresh-water eels. The warm blooded animals which succumb to infection are guinea pigs, rabbits, new-born dogs, new-born cats, common mice, field mice, bats, chickens and pigeons (Sanarelli). The virulence of the organism varies greatly. Cultures gradually lose their virulence with age, but blood taken from the animal and sealed in tubes will retain it for months. Infection produces a septicemia. Warm-blooded animals are seized with shivering and restlessness, followed by prostration and death. Cultures can be obtained from the blood and from all the fluids and organs of the body. Exudations of blood-stained fluid occur in all the serous cavities, especially marked in the peritoneum. Histologic examinations reveal focal necroses in the spleen, liver, brain and spinal cord with congestion in the other organs. In the frog, intermuscular hemorrhages occur with destruction of muscular fibers. The organism produces powerful toxins which were divided into two classes, one resembles in its action digitalis and the other veratrin.

BIBLIOGRAPHY.

Sanarelli: Ueber einen neuen Mikro-organismus des Wassers, welcher für Thiere mit veränderlicher und konstanter Temperatur pathogen ist. Centralblatt für Bakteriologie und Parasitenkunde, B. ix, 1891.

Trambusti: Ueber die physiologische Wirkung der Stoffwechselproducte des Hydrophilus Fuscus. Beiträge zur pathologischen Anatomie und zur allgemeinen Pathologie, B. 14, Heft 2, 1893.

Rogers, M.: Une épizootie observée chez des grenouilles. Comptes rendus de la Soc. de Biologie, 1893.

CHRONIC NASAL CATARRH.

Read before the Sixty-sixth Semi-annual Meeting of the Fox River Valley Medical Association, Elgin, Ill., May 24, 1898.

BY HENRY G. OHLS, M.D.

CHICAGO.

What is nasal catarrh? I believe the only comprehensive definition is: A pathologic change in the system or in the structure of the nares, accompanied by altered function of the mucous membrane. Nor do I place the constitutional before the local causes on account of their greater importance and frequency. On the contrary, the large majority of cases depend upon local causes and are amenable to local treatment. My definition includes a great variety of conditions, and for the very good reason that catarrh, so-called, necessarily includes a great variety of conditions or diseases requiring the most diverse measures, medicinal and operative, for their successful treatment.

It is a popular fallacy that catarrh runs into, or predisposes to, tubercular diseases. On the contrary, Bosworth ("Diseases of the Nose and Throat," Vol. I, page 99) ridicules the idea of a catarrhal diathesis, and claims that catarrhal inflammation always remains catarrhal, producing hypertrophy, never ulceration or necrosis. As to catarrh inducing tuberculosis, Dr Ingals (JOUR. AMERICAN MEDICAL ASSOCIATION, June 12, 1897) from a careful analysis of 14,953 private case-records, finds that nasal catarrh is less frequent in a given number of tuberculous patients, than in the same number of healthy people.

Physiology.—Formerly the nose was considered the organ of smell, but physiologic research has demonstrated that the olfactory function, although exclusive, is no more important than its functions in respiration, in phonation and in audition. Indeed, the impairment or loss of the sense of smell is a far less serious matter than interference with the other functions.

The respiratory function includes filtering, warming and moistening the inspired air, all of which take place in the ciliated portion or middle and lower meatûs. Coarser particles inhaled are entangled in the vibrissæ and, unless the air inhaled is excessively dust-laden, the finer particles are arrested by the cilia and carried downward by the serum. The air is warmed in its passage through the nares by the large mucous surface exposed and especially by the superficial location of the sinuses of the turbinates which respond instantly when the inspired air is cold and dry. Goodale (*Boston Med. and Surg. Jour.*, Nov. 5 and 12, 1896) found that the relative humidity of the air after passing the nasal chambers is near the saturation point with reference to its own temperature. Aschenbrandt and Kayser demonstrated that the turbinates secrete 500 grams of serum in twenty-four hours. Wright and Park (*Laryngoscope*, June, 1897) found that nasal mucus is not bactericidal, but is not a good medium, while many germs are washed away by it. The importance of normal functional activity on the preparation of the air for the delicate structures it encounters below can scarcely be overestimated.

The ideal nares are symmetric cavities with no opposing surfaces in contact, as Pynchon tersely describes it (JOUR. OF AMER. MED. ASSO'N, Dec. 12, 1897). He emphasizes impaired ventilation and drainage as the common cause of catarrh. As a *rara avis in gurgite vasto* the ideal naris is comparable to an ideally beautiful face, which does not imply that most of us need nasal operations any more than we need plastic operations for cosmetic effect. The test for operative interference is largely the amount and character of obstruction met with, whether it consists in deviation or thickening of the septum; of enlarged and malformed turbinates; of thickened mucous membrane and swell-bodies or of abnormal growths.

Chronic catarrh, for convenience of description, is divided by Ingals ("Diseases of Chest, Throat and Nasal Cavities," 3d Ed., p. 25) into four varieties. 1, Simple chronic catarrh. 2. Intumescent rhinitis with frequent swelling of the membrane on the turbinates, and on the upper part of the septum on one or both sides, but more often alternating from one side to the other. Seiss (Burnett, I, p. 633) calls this the vasoparetic period or stage of dilatation of the venous sinuses. 3. Hypertrophic rhinitis or the state of fibrous metamorphosis of Seiss. 4. Atrophic rhinitis, usually a sequel of the hypertrophic form, but much less common.

SIMPLE CHRONIC RHINITIS

Is a catarrhal inflammation with little swelling, but great irritability of the membranes, with congestion and profuse, watery, or irritating mucopurulent secretion. It occurs among all classes and in every climate, but children are more susceptible than adults.

Etiology.—The causes of simple chronic rhinitis are not materially different from those of acute colds. The chronic form generally supervenes in subjects who, from exposure or debility, acquire frequent colds, and throughout its course the patient is liable to have frequent acute exacerbations.

Symptoms.—A history of almost constant nasal irritation, with frequent sneezing, itching and burning, and extending over many months regardless of the seasons, points toward chronic rhinitis. Headache and pain in the eyes are common symptoms. The early watery discharge later becomes thick and mucopurulent. The digestive functions are sometimes

impaired, but the general health is not often affected. Upon inspection the membrane is seen to be congested and bathed in excessive secretion. In about half the cases deviations or spurs of the septum encroach more or less upon the cavities. The membrane of the nasopharynx is generally congested and the excessive secretion forms thick gelatinous masses that are expelled by hawking. The nares may remain free, except for secretions, but the disease generally results, after months or years, in either atrophy or hypertrophy of the membrane and underlying structures.

Diagnosis.—Hay fever resembles this condition somewhat in the watery discharge and spots on the membrane very sensitive to the probe; but the former is readily distinguished by its sudden appearance and periodicity at certain seasons, by excessive swelling of the mucous membrane and the more severe constitutional disturbance as well as by the well-known results of change of climate.

Treatment.—In the treatment of simple chronic rhinitis the objects to be attained are the relief of excessive sensibility and the checking of excessive secretion. For the former, oily antiseptic sprays, such as liquid albolene, 1 ounce, with terebene, v to x, may be sprayed into the nares freely two or three times a day with Davidson's No. 50 atomizer. This also tends to check the secretion, but if greater astringent effect is desired a few grains of the following powder should be blown into the nares once or twice a day: Alumnol 1, soda bicarb. 1, soda bibor. 1, mag. carb. 2, cocain mur. 2.5, iodol 20, sacch. lact ad 100. In every case applications should be so mild as to cause only temporary discomfort followed by a sense of relief. When spots of tenderness are found, with frequent sneezing, superficial cauterization will overcome the sensitiveness without destroying the membrane. Small areas only, not over 5 to 10 millimeters in diameter, should be cauterized at one time, and about a week should intervene between cauterizations, with the use of sedative applications in the intervals.

When the secretions are thick and difficult to dislodge, antiseptic, alkaline washes give great relief, and should precede the use of the oily spray, especially in the morning when the greatest collection of secretions is liable to occur. The ideal solution is agreeably aromatic, mildly alkaline and antiseptic and of a specific gravity near that of the nasal serum (1015). These conditions are met very closely by the solution of Rhodes' tablets of the following formula, when dissolved in four ounces of tepid water. (*Jour. of Laryngol., Rhinol. and Otol.*, January 1897).

R.	Potass. chlor.	2½ grs
	Soda bicarb.	10 grs
	Soda chlorid. C. P.	10 grs
	Soda salicylate	5 grs
	Soda bicarb.	5 grs
	Thymol	⅛ gr.
	Eucalyptol	¼ min.

The Bermingham douche is a convenient instrument for introducing the solution.

INTUMESCENT RHINITIS

Is the most common form of chronic catarrh, and is characterized by intermittent swelling of the mucous membranes with corresponding stopping up of the nares. Upon lying down the lower naris is generally occluded.

Etiology.—The causes of this condition are the same as those of simple chronic rhinitis.

Symptoms.—To the symptoms of simple chronic rhinitis are now added the obstruction to nasal breathing, and all the long train that logically follows. The secretions may remain thin, but are more often thickened and may form crusts difficult to dislodge, but becoming offensive if long retained. Drinking warm fluids in this condition often dislodges masses of secretion that nauseate the patient. Mouth-breathing becomes more pronounced as the amount of swelling increases and in proportion to the respiratory need. Thus with moderate swelling a patient may be unconscious of mouth-breathing unless extra exertion calls for more air than the nares can admit. But even when at rest a series of ordinary inspirations will be followed by a yawn or a deep inspiration. During sleep the mouth is often kept open and the patient rises with a dry throat and coated tongue. The membrane is often irritable, with spots sensitive to pressure with the probe. The slightest touch over these sensitive spots causes an intense burning sensation and is often followed by sneezing (S. F. Snow, *Med. News*, July 10, 1897). Frontal headache is a common symptom, especially when the middle turbinate is swollen. The sense of smell is abolished when the naris is occluded.

Suffusion of the eyes, with mild conjunctivitis, occasionally occurs with this condition of the nares. Inhaling through partially obstructed naris causes a partial vacuum in the passages behind the seat of obstruction. This is the principal physical factor in the chronic congestions of the membrane lining the nasopharynx, the pharynx, larynx and trachea, all of which frequently follow prolonged obstruction.

The proper ventilation of the middle ear is affected unfavorably by nasal obstruction and long-continued tinnitus is often followed by sclerotic changes that impair the hearing.

The voice is affected both by the congestion of the larynx and by the lack of resonance due to nasal obstruction. It is thus not only unpleasant as to quality, but speaking and singing become an effort that can not be long sustained.

I will not attempt to enumerate the remote symptoms except chronic cough due to some of the above conditions, and asthma which is associated with a certain proportion of cases of intumescent rhinitis. Wm. L. Ballenger (*Medicine*, November, 1897), and Titeff ("Thèse de Genève," 1896), note the aprosexia exhibited by severe cases, and attribute it to autointoxication due to accumulation of carbon dioxid in the blood. It seldom approaches in severity the same symptom in children with adenoids.

Upon inspection the nasal membrane is found swollen smoothly upon one or both sides so that the normal space is closed anywhere from a small fraction to totality. The swelling on the septum is generally far less than that on the turbinates. The membrane is usually congested. Firm pressure by the probe will flatten the membrane against the bone, but the groove thus formed quickly fills up when the pressure is removed. A solution or powder containing 4 per cent. of cocain will also quickly reduce the swelling.

Diagnosis.—The swelling of the membrane distinguishes this from simple chronic rhinitis; occurrence regardless of seasons, from hay fever; intermittent smooth swelling, from hypertrophic rhinitis. Mucous polypi are differentiated by passing the probe to either side of them, by their being movable and by the effect of cocain.

Prognosis.—Spontaneous recovery occurs rarely.

More often the disease lasts for years and eventuates in the hypertrophic form. Pharyngitis, laryngitis and throat-deafness, are common sequelæ, and are especially intractible unless the nasal cause is recognized and relieved. The aprosexia mentioned above is associated with a lessened resistance of the system to morbific influences.

Treatment.— Prophylaxis demands avoidance of exposure to the common causes of taking cold. Persons who are particularly susceptible should constantly wear woolen underclothing of suitable texture. Cold bathing or sponging with friction to cause reaction is a valuable measure. The digestive and eliminative systems should receive due attention to maintain a high standard of functional activity. Acute colds should have immediate attention. Cases of intumescent rhinitis that are mild in this variable lake climate with its sudden changes of temperature and excessive humidity improve rapidly upon removal to warm, dry regions. Mild oily sprays and alkaline washes should be used in mild cases much as in simple rhinitis. I prefer solutions of camphor, gr. ½ to 1, or menthol gr. 1 to 3, to the ounce of albolene. When the swelling becomes annoying only on taking cold and at long intervals, the patient may be provided with a powder containing 4 per cent. cocain only to be used very sparingly at the time of greatest discomfort, which is usually in the morning or evening. It must never be used except under the strictest limitations, and the patient should never have a prescription for it. If all patients were ignorant of the properties of cocain it would be easier to confine its use within proper bounds.

Well developed cases obtain only temporary relief from the applications mentioned. When the swelling causes more frequent and annoying obstruction, removal of the excessive tissues by surgical means including cauterization offers the only prospect of speedy relief.

Cauterization of the membrane in lines (Ingals) or in spots (Bosworth) by application of chromic acid was formerly the best available means. This application, however, is painful and causes a sore that heals slowly, while the scab is hard and irritating to the tissues adjacent.

Electricity in the form of the galvanocautery offers a method that is certain, easily controlled and in every way desirable. The method perfected by Dr. Ingals (p. 538) I have used in a large number of cases with great satisfaction. After anesthetizing the swollen lower turbinate thoroughly with a 4 per cent. solution of cocain, the cold electrode is inserted and applied against the posterior end. The contact button is pressed and the electrode drawn slowly forward through the most prominent swelling. Pressure should be exerted until the operator feels the electrode "grate" on the bone. The electrode must be removed from the tissues before breaking the circuit, to avoid tearing off the eschar, and it is then allowed to cool before it is withdrawn from the nostril. The naris is sprayed with albolene containing a few drops of oil of cloves to the ounce, and iodol is insufflated. The patient is directed to wear absorbant cotton in the nostril when out of doors. He is also provided with an oily antiseptic spray to be used freely, and a powder containing 4 per cent. cocain to be used sparingly, and only when the naris is closed by swelling. On the fourth day the scar tissue is gently removed. This usually prevents the formation of adhesions. The cauterization is repeated at intervals of two or three weeks until both nares remain freely open. Two cauterizations on each side are usually sufficient. There is no danger of destroying too much tissue if this rule is observed. In a few cases where too severe reaction follows cauterizing the whole length of the turbinate, it is better to cauterize only half a line at one sitting. The electrode is made of No. 21 platinum wire, which retains the heat sufficiently to burn through any thickness of tissue liable to be encountered in the nares. Many electrodes in the market are so light as to be mere "spiel-zeuge" as our German friends say. For some years I have used two chlorid accumulator cells of type D, three plates, to heat the electrode.

HYPERTROPHIC RHINITIS.

Hypertrophic rhinitis consists essentially in chronic thickening of the turbinates, and is often associated with malformation of these structures and with deviations and spurs of the septum. Thus the nares are obstructed and the passages irregular, causing the greatest interference with nasal functions.

Etiology.—The hypertrophic is commonly the sequel of intumescent rhinitis, and the causes are the same.

Symptoms.—The subjective symptoms are the same except that the obstruction is more constant, the post-nasal secretion more annoying and the pressure and obstruction symptoms more marked. Upon inspection the membrane is found thickened, but less congested than in the intumescent form. It is also often uneven and the swelling is irregularly distributed. The lower turbinate is most often affected, but the middle turbinate is occasionally greatly hypertrophied and presses upon the septum. Mucous or mucopurulent secretions collect in the fossæ, and dry crusts form in the concavities of the septum. The posterior ends of the lower turbinates may fill the choanæ and project into the nasopharynx.

Diagnosis.—Pressure with the probe detects greater density than in the intumescent form, nor is the swelling reduced markedly by the application of cocain.

Prognosis.—This disease is liable to remain for many years, but a small number of cases undergo atrophic degeneration from causes at present not well understood.

Treatment.—The indications are to restore the normal contour of the nares, and the efficient means to that end are necessarily surgical. The use of acids is no more desirable or efficient in this than in the intumescent form. Of surgical instruments the scissors, saw, snare, trephine, spoke-shave and electrode each has its advocates, and each has its peculiar field of usefulness.

Soft hypertrophies hanging downward like a curtain from the turbinate can be readily snipped off with scissors. Bony hypertrophies yield to the saw or trephine. The spoke-shave of Carmalt Jones has given rise to a vast amount of discussion ("American Year Book," Gould, 1898, p. 871), but the cases that require such radical treatment are few. Dundas Grant (*Jour. of Laryngol.*, May, 1897) advocates anterior turbinectomy, making an incision with strong scissors, and completing the operation with a snare. Posterior hypertrophies can be removed by the cold snare. It would seem that eucain would be preferable to cocain, as a local anesthetic for this operation, as it does not cause so much contraction of the tissues (L. A. Somers, *Therap. Gazette*, Jan. 15, 1897). Preston M. Hickey (*The Phy. and Surg.*, Detroit and Ann Arbor, January, 1898), modified the Jarvis' snare by drilling a

hole one-fourth inch from the end of the canula and passing the loop through it to grasp the posterior hypertrophy more readily. L. A. Coffin in the current *Laryngoscope* described an ingenious syringe for injecting monochloracetic acid into posterior hypertrophies via the mouth.

Submucous cauterization by a lance-shaped electrode (Blondian, *Jour. Laryn., Rhin. and Otol.*, December, 1896), avoids the liability of synechia formation. D. Bryson Delavan (*Laryngoscope*, August, 1897) advocates submucous incision with an ophthalmic knife. None of these methods are as satisfactory in the average case as the method of linear cauterization described in the consideration of intumescent rhinitis. When deflections or spurs of the septum encroach unduly upon the normal cavities the removal of excessive cartilage and bone, and straightening the deflection become necessary. Submucous thickening on the sides of the vomer causes obstruction and is readily reduced by linear cauterization.

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BIBLIOGRAPHY.

Ingals: Diseases of the Chest, Throat and Nasal Cavities, 3d Ed.
Burnett: System of Diseases of Ear, Nose and Throat.
Bosworth: Diseases of Nose and Throat.
Bishop: Diseases of Ear, Nose and Throat.
Miller, McEvoy and Weeks: Ear, Eye, Throat and Nose.
Jackson and Gleason: Essentials of Diseases of Eye, Nose and Throat.
Woakes: Post-Nasal Catarrh, 3d Ed.
Walsham: Nasal Obstruction.
Gould: American Year Book of Medicine and Surgery.
Cryer: Abnormalities of Bony Structures of Nares and Face (Jour. of Am. Med. Ass'n., April 2, 1898).
L. Polyak: Hypertrophy, Archiv. für Laryngol. und Rhin., Bd. vi, Heft i.
Ewing: Diathesis, Laryngoscope, November, 1897, p. 278.
Pynchon: Ventilation, etc., Laryngoscope, December, 1897.
Waldow: Deformity of Jaws and Nasal Obstruction, Arch. für Laryng. und Rhin., iii, Bd. 3.
Leland: Nasal Obstruction and Diseases of Ears, Boston Med. and Surg. Jour., Aug. 26, 1897.
Briggs: Cold Bathing. Occidental Med. Rec. Oct., 1897.
Piaget: Local Treatment. Thèse de Paris, 1896.
Bergengrün: Irrigation, Petersburg Med. Woch., 1897, No. 24.

CAUSATION THE FACTOR IN TREATMENT.

Read at a meeting of the Portland Medical Society, March 1898.

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The instinct of self-preservation is probably the strongest characteristic which we see exhibited throughout all the animal kingdom; nor does this tendency of living things to remain alive seem to be entirely due to an instinct, but there seems to be a constant effort on the part of the tissues themselves to prolong and preserve that series of phenomena which we call life, entirely independent of any volition on the part of the individual. We find this effort displayed not only in the animal kingdom, but in the vegetable as well. We see the seeds of small plants and vines, having taken root in unsuitable places, sending out their shoots through cracks and chinks in walls to gain the sunlight; the roots of trees curving around rocks and obstacles, and even displacing these by the exertion of considerable force, to reach the rich soil below. Nor does nature alone seem to tend to the perservation of the individual, but by her mysterious and manifold methods of reproduction apparently does all in her power to perpetuate the existence of the species. I say apparently, for if that loop-hole was not left it might be difficult to explain the certain death that finally overcomes each and every living thing, gradually causing whole species and even classes to become extinct and to disappear from the face of the earth, without casting doubts on the sincerity or ability of nature to carry to a successful issue the plans she has laid out.

As far as we know, all living bodies can be resolved into a certain number of chemic elements, which belong distinctively to the mineral kingdom, to the absolutely physical nature. The mineral existed before the living world, and in some incomprehensible manner, life made its appearance on the earth. If we could regard life as a form of motion, it would not seem to be going too far out of the way to apply Newton's law to the series of phenomena which make up life. A body at rest tends to remain at rest; a body in motion moves with a uniform velocity in a straight line unless acted upon by some external force to change its condition; in other words, life having once started tends to go on as such until acted upon by some external force, which is incompatible with it. Could we by any means determine what force or forces interrupt life we would be in better condition to try and contend with them. If a cannon ball fired from some huge gun meets with no obstruction in its path it tends to keep on going in a straight line, only impeded in its course by the force of gravity, which, acting on it continually, finally brings it again to a condition of rest. It seems not improbable that there may be some similar force which acts on the living individual from the very moment of conception to the time of death.

As physicians, self-appointed custodians of the public health, whose professed aim in life is not only to ward off the accidents with which our lives seem to be beset, but to do all in our power to preserve and prolong life, it behooves us to inquire into the causes which bring about its cessation.

Let us inquire, first, what seem to be the causes of death in the natural course of events? By this I mean what is called death from old age, not the immediate cause, but the conditions which have brought about the opportunity for the occurrence of the immediate cause? What differences in structure would we find in the body of an individual having died of old age, from those to be found in the body of a new-born child, more than those of size and weight? As far as we would be able to see with the present means at our command, the main difference would be found to consist in a great increase of the fibrous structures of the body over the cellular elements, which are so richly developed in the very young. Again we see the same difference existing between the first tender shoot which makes its appearance above ground in the spring and the old and wind-battered tree, which, like every other living thing, is obliged to meet its final fate. We find this increase of fibrous tissue to be located principally in the walls of the arteries and in the immediate neighborhood of the capillaries, particularly among those which ramify throughout the glandular organs of the body, as well as among the nervous structures. We find, in other words, a more or less generally disseminated sclerosis. On the integrity and functional activity of the blood vessels the nutrition of the tissues depends. The food that we take into our mouths, after being acted upon in the alimentary canal, is either directly absorbed into the blood, or poured as chyle, directly into the blood vessels, by means of which it is carried and distributed to all the tissues of the body, where each takes what it is most in need of and gives up that which is either necessary to some other tissue, or which is to be excreted from the body as useless or even harmful to its functional activity. This increase

of fibrous tissue in the blood vessel walls must necessarily interfere with the nutrition of all the tissues of the body, impairing the function of all the glandular structures by offering an obstruction or inteference to the normal interchange of product between the tissues in the blood vessels and those outside, and it is further possible that the increase in the fibrous reticulum of the glands themselves, through which the capillaries mainly pursue their course, may operate by producing atrophy and consequent diminished activity of the glandular epithelium, by an encroachment on their territory.

When the ovum of the female becomes fertilized by the absorption into its interior of the male spermatozoon we see the original cell split up into two cells, then into four and so on, without there being any particular difference apparent in these cells, until they begin to arrange themselves into layers, when three distinct portions become differentiated from each other. From the two external layers are derived all the epithelial tissues of the body as well as the nervous structures, in other words, the chemically active tissues of the body and the nervous tissues which preside over the co-ordination of these functions; while the middle layer gives rise to the connective tissues, or those tissues which have a more purely mechanical function, with the one startling exception of the sexual organs, whose importance in the production of the future generation must not be overlooked. In the middle layer what is known as the area vasculosa makes its appearance, which is supposed to be the beginning of the vascular system, and from the endothelial cells or plates, which form the inside lining of the vessels, the first formation of fibrous tissue takes place, and with the advance and spreading of the blood vessels this tissue is carried along throughout all parts of the body, and it seems fair to suppose that the fibrous reticulum, which makes up the scaffolding of the glandular tissues, is derived directly from the capillaries themselves. Thus we see that from the very beginning of life a tissue is being formed which, in the absence of any other accident, will eventually bring about the cessation of life, just as in the case of the cannon-ball, the same force of gravity acting on it from the start, in the end brings it to a period of rest, providing no other obstruction intervened. Granting the preceding to be facts, it must follow that any thing which increases the tendency to the formation of fibrous tissue hastens death, while anything which diminishes this tendency must act to prolong life.

In Dr. Meigs book on "The Origin of Disease," the importance of fibrous tissue in the blood vessels, as a causative factor of disease, is particularly dwelt upon, and if I understand correctly the philosophy of this book, it is to teach us that most chronic diseases are simply premature old age, and the consequent necessity of our consideration of the patient himself as an entity in our treatment of him, instead of directing all our efforts to subdue symptoms due to a local disorder, which may be only due to the outcropping in one particular organ of a process really widely disseminated throughout the body. Dr. Meigs classifies all diseases as arising from either intrinsic or extrinsic causes. If I might hint at a classification, I would suggest that all diseases arise from either infection or disorders of nutrition. Dr. Meigs' classification, as far as the extrinsic causes go, is simple enough, but it seems that the intrinsic causes might be open to doubt. For instance, an alcoholic subject who dies from cirrhosis of the liver, dies from an intrinsic disease brought about by an extrinsic agent, the alcohol. In the classification which I suggest, cirrhosis would naturally come under the head of a disorder of nutrition, just as old age would, whether it is allowed to come on by itself, as a natural result of the forces at work, or whether it is hastened by an extrinsic cause.

Infectious diseases tend to get well of their own accord; that is, the inherent forces of the tissues themselves are generally sufficient to overcome the infection and prevent any great disorder of nutrition, where the infection is not too great. Where the infection is too great, disorders of nutrition are produced, and we find the tendency toward the production of fibrous tissue increased, as we see well illustrated in the sequelæ of scarlet fever, typhoid fever, tuberculosis and other diseases. Everything seems to prove that syphilis is undoubtedly an infectious disease, and yet one of its most startling anatomic features is the increase of fibrous tissue, which suggests the doubt as to the complete curability of the disease. An individual may be cured of all his symptoms, he may be cured of the contagion, he may have healthy offspring, but is it not probable that his life is shortened by the disease, and if so, can it be said to be truly cured? In the business carried on by a life insurance company, medical knowledge would seem to find its commercial value, and the unwillingness of such companies to accept syphilitic risks, shows by experience that life is thereby shortened.

In regard to infectious diseases, I have always had doubts that in the microbic theory of disease, the story was more than one-third told. The schizomycetes, to which the so-called pathogenic bateria belong, are a part of the vegetable world. Vegetable life is dependent first on the seed, secondly on the soil, and thirdly on the climate. A cocoa-nut will not grow and bear fruit in the arctic circle, and we know that certain infectious diseases, which flourish in the tropics, do not occur spontaneously in the temperate zones. The microbes furnish the seed, the tissues of our bodies the soil, and surrounding circumstances may play the role of climate in many infectious diseases. Syphilis is a disease which particularly affects the human race. I believe that there is no authentic case of its successful inoculation in the lower animals, as demonstrated by the consequent symptoms beyond a reasonable doubt. All animals do not respond alike to the action of pathogenic bacteria, some species, so far as we know, being absolutely immune to certain bacteria. This may be a question of soil. Two individuals may be exposed to smallpox and only one of these contract the disease; scarlet fever breaks out in a school, all the children are exposed, but only a limited number are attacked. May this not be owing to some condition present in the tissues of the individuals which may take the place of climate. Experience and statistics have always seemed to show that some diseases appear to be hereditary, and again to refer to the opinion of life insurance companies, these companies are always careful to inquire very thoroughly into the family history of an applicant before granting him a policy. Can not this apparent inheritance of disease be explained on the ground of inheritance of the soil, just as we inherit the outward configuration of our parents, without making it necessary to inherit the

disease itself, which seems to be contrary to physiologic laws.

A few years ago the practice of medicine was based almost entirely on symptomatology, which seemed to be an advance over the older empirical method. Today we seem to be in an anatomic age, in which treatment and classification is based on structural change, a much greater step in advance, but the one to be hoped for in the future must be based on causation, for that attacks disease at its origin and results in prophylaxis, which, if it could be carried out, would abolish the existence of disease. And already what tremendous strides have been made in this direction, so far as infectious diseases are concerned! Where the seeds of the disease can be absolutely excluded, the soil and the climate are of less importance. Puerperal fever has almost disappeared; septicemia as a sequel to surgical traumatism, is now very rare, and with still further improved methods, should become obsolete. But we must not forget that microbes are an invisible foe; that they are widespread in nature and can not under all circumstances as yet be combated by either mechanical or chemic means, and it is here where soil and climate assume their importance. If we could only render the soil unfertile, the climate unsuitable, the mere presence of the seed would not cause us much annoyance. If we could only see how the tissues themselves combat infection, we could then, perhaps, aid them in their battle. Let me take a simple example. An acute gonorrhea is an infectious disease; its most objective symptom is a discharge of pus from the urethra; this discharge of pus is an effort on the part of the tissues to rid themselves of the disease; an increased flow of blood is determined to that part of the urethra attacked; quantities of leucocytes are thrown out; the superficial epithelial cells, which are first attacked by the gonococci, are thrown off and passed out of the urethra; so long as the discharge persists we believe the disease to be present; our object, then, should not be to stop the discharge, but to assist the tissues, and that is just what the modern treatment of gonorrhea attempts by the use of germicidal irrigation; even the so-called abortive plan, the benefits of which are still in doubt in the minds of most surgeons, has the same object in view, to aid in the desquamation of the diseased cells. What we have yet to learn in many conditions is which symptoms are the result of effort on the part of the tissues to combat the infection, and which are caused by the victory of the infection over the tissues; that is, which symptoms to encourage and which to overcome. Even pain is not always to be overcome, as it often acts as a salutary warning.

As to the diseases arising from disorders of nutrition, whether they all give rise to the production of fibrous tissue or not, though there seems to be very good evidence that they do, directly or indirectly. We have seen that these changes are in some way connected with the blood vessels. To explain what I have just said, let me state that in the light of recent investigations by some of the most noted pathologists, there seems to be good ground for the belief that many of the so-called degenerations, such as mucoid, colloid, hyalin, amyloid, etc., are preceded by or dependent upon the formation of fibrous tissue. We have seen that this fibrous tissue about the blood vessels is a constant accompaniment of old age, and it has been shown almost conclusively that it is produced by the endothelial plates lining the blood vessels, by the intima and not the adventitia. The studies of the changes which take place in the capillaries is very much more difficult than those which take place in the larger blood vessels, owing to the post-mortem changes which seem to occur almost immediately in the endothelial plates, of which alone the walls of the smallest capillaries consist, but from the fact that it seems probable that the fibrous network of the glandular structures owes its origin directly to the vessels which ramify through it, any increase in this fibrous tissue must be produced from the endothelial lining of these vessels, and traceable perhaps to some change or irritation which has taken place in this endothelial lining. We know how readily adhesions are formed as a result of any irritation to a serous membrane, serous membranes being covered with endothelial cells identical with those lining the blood vessels, and adhesions consisting of fibrous tissue. Now if we could account for any irritation to the endothelium of the blood vessel walls, we might perhaps be able to account for the production of sclerosis. As the blood is the only tissue which is constantly in contact with the endothelium lining the blood vessel walls, and as the blood is constantly changing its composition, according to the amount and variety of food which is directly poured into it, it would seem rational to find the source of irritation which gives rise to the production of fibrous tissue, to reside in our food itself. In other words, it is indirectly our food which eventually kills us. In the vegetable world we see the same thing among bacteria during the process of putrefaction. At first we have only aerobic bacteria, which give rise to the production of carbonic acid, which finally encompasses their destruction; these are followed by the so-called facultative bacteria, which are both aerobic and anaerobic; these are again followed by anaerobic ones, and each finally disappears by the products of its own chemic changes. We are at once faced with the terrible proposition that that which is absolutely necessary to our existence eventually brings about our destruction.

As I stated in the beginning of this paper, all living bodies are resolvable into their chemic elements; that is, our tissues are made up of a not very large number of chemic elements, whose molecules are held together in such peculiar arrangement that they are capable of exhibiting those phenomena which we are in the habit of calling vital. Could we increase our knowledge of the chemic changes which go on in the cells during absorption and elimination, and of the consequent physical changes which take place, we would be in a better condition to contend with disease, and I believe that it is along these lines that our greatest discoveries will probably come. And perhaps it may be eventually proven that the same physical laws which govern the movements of the planets, govern what we are pleased to call vital phenomena.

If we look over the list of diseases which we are able to cope with successfully by the use of medicine, diseases in which we would all agree upon the treatment, malaria and syphilis stand out prominently. Upon what is their treatment based? Empiricism pure and simple. Quinin was used long before the discovery of the plasmodium malariæ. What the future may hold for us, when time has been able to sit in judgment on the results of serum therapy, and treatment by animal extracts, it is yet too early to say. Surgery would undoubtedly claim for itself the great-

est advances, but if we sift down the facts will we not find that those advances have been more in the line of possible mutilations than in the cure of disease? The successful removal of a woman's stomach in its entirety is undoubtedly a great surgical feat, but was not its removal caused by a confession on the part of the surgeon of his inability to cure the disease. Far be it from me to in any way minimize the untold benefits which have been enjoyed by suffering humanity, as a result of the hard work, the deep study and the combined efforts of all who belong to the medical profession, and to be a member of which I consider myself honored, but it seems to me that it is sometimes healthful to stop and consider what we are really doing; not to rest too comfortably on our laurels already obtained, but by a just and honest view of our possible shortcomings, to remember that there are new fields to be cultivated, new glory to be won in our everlasting battle with disease, and that each one of us, however humble we may be, may by diligent work, thought and observation, be able to add our mite to that grand sum which makes up the total of human knowledge.

A RATIONAL METHOD OF RELIEVING ASPHYXIA IN THE NEW-BORN INFANT.

Read before the Florida Medical Association, April 27, 1898.

BY S. STRINGER, M.D.

BROOKSVILLE, FLA.

I desire to call the attention of the medical profession to a method of relieving asphyxiated new-born infants which I do not think has been presented to their notice heretofore.

I do not claim for this method that it is novel, unique, etc., but that it is based entirely upon chemic and philosophic principles and, like many other facts in our profession, is the result of accidental discovery.

We know that in the asphyxiated infant, unless the blood becomes oxygenated very soon, the child must die; we know that from several causes the sensorium has become so deadened or blunted as not to respond to the irritation of the atmospheric air, the application of water or other methods of inducing respiration; yet fetal life still remains and would continue were it not that the placenta has become detached and thereby respiration or oxygenation of the blood, through the medium of maternal circulation, is cut off. Now, if we could maintain fetal life by any method until the sensorium can sufficiently recover to respond to the nervous excitants of respiration we would, in many instances, save the life of the infant.

How this is to be done is the object of this short essay, as well as to relate the circumstances which led to the discovery thereof.

A few years ago I was called to see a multipara in labor and was told she was in about her fifth month of pregnancy. In a few hours she was delivered of a fetus which I thought to be close to the age indicated. The fetus, membranes and placenta were all delivered by the same effort. Nothing unusual having occurred, the fetus and envelope were laid aside till my departure, when I had it placed in some cloths and rolled up to carry with me for the purpose of saving it as a specimen, but, it being late at night, I deposited it till morning, when I proceeded to examine it and, to my astonishment, found the fetal circulation still going on, with pulse at wrist very perceptible. This was several hours after birth. Here was a case of fetal circulation, to my mind, carried on by the aeration of the blood through the medium of the placenta exposed to the atmospheric air.

In contemplating this case it occurred to me that this information might be utilized in cases of asphyxia in new-born infants, and I resolved to try the first case that came under my care.

At last a case presented itself; a large and well-developed child, of white parentage, and in which the head had been molded into cylindrical form by a narrow pelvis. The child could not be induced, by the usual method of cold application and rolling, to make any effort at respiration. The circulation was still going on in the funis with some vigor, but the deepening of the dark hue of the surface plainly indicated that, unless oxygenation of the blood could take place, death would soon follow.

Already the pulsation in the cord had become feeble and was becoming more so rapidly, when I delivered the placenta, cleaned it of clots and exposed the maternal surface to the atmospheric air. In a very short time the pulsation was perceptibly increasing in force; the livid and death-like hue was being displaced by one of life and health, when it required but a few moments for the restoration of sensibility and process of respiration commenced.

I feel sure that had the placenta remained in the os uteri or vagina, excluded as it was from atmospheric air, death from asphyxiation of the child would certainly have occurred.

Several subsequent cases have proven, to my mind, that this simple and rational plan of restoration is preferable to all others; and I will ask, Why not? Does not the blood become rapidly oxygenated when exposed to the air even in an open vessel? Have you not seen venous blood reddened in a few moments after exposure to atmospheric air? Then, why not when exposed to the air by osmosis, through the irregular surface of the placenta, where aeration had been going on from the time of the earliest distinct organization of the embryo?

In nearly all cases of asphyxia the labor has been tedious, owing to narrow passage and time to mold the head to the same by the powerful expulsive effort which detaches the placenta and throws it into the os, or entirely into the vagina, as the child emerges from the third stage of labor. Therefore you will find no difficulty in the immediate removal of placenta, should you have a case of asphyxia.

After its removal from the vagina it will be much easier to lift the cord from the neck and examine it for any interference with free circulation and correct the same. The placenta should be spread out with maternal surface cleansed of all clots and membranes so that free access of air can be had. If it becomes necessary, on account of numerous clots, to use water to cleanse the maternal surface, it is advisable to have it warm, as it is remarkable how quickly the use of cold water will chill the child; yet it is but natural to expect such result when you apply cold to so large surface of the capillary circulation as is maintained in the maternal surface of the placenta.

So long as the circulation keeps on through the cord you need not fear for the life of the child, for it is a continuance of fetal life, after birth.

As soon as respiration occurs, which has been delayed as long as twenty-five minutes in some of my cases, the circulation is diverted from the placenta to the lungs, and pulsation in the cord ceases in a few

seconds, when the child should be separated from the placenta as in ordinary cases.

I commend this method to the profession and ask that it be tried where more cases present themselves than are met with by provincial practitioners, when, I am convinced, it will be universally adopted.

I can not omit referring to the great advantages which, it seems to me, must result from the delivery of the placenta in cases of placenta previa, advantages not only to the mother but to the offspring. As the consideration of this subject would require considererable time I will only give a few extracts from the literature on dystocia. Dr. Simpson has collected 120 cases in which the placenta was delivered prior to the birth of the child. Of this number 31 of the children were born alive, 2 were putrid and 87 still-born. I have no doubt but that a large per cent. of the 87 still-born died of asphyxia, in consequence of the retention of the placenta for some time after its detachment. Had it been promptly delivered and exposed to atmospheric air many lives would have been saved.

ALBUMINURIA FROM THE STANDPOINT OF LIFE INSURANCE.

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At the present day, in considering the advisability of accepting a certain risk, the presence or absence of albumin in the urine may be readily regarded as the deciding weight, either for rejection if present or acceptance if not. Certain it is that the examination of the urine for this abnormal ingredient is looked upon by the home office as of such importance that except in industrial insurance, no report will be accepted without definite statements. Nor is this a matter of surprise when we remember the large number of fatal diseases accompanied by albuminuria. In many companies the albuminuria alone is sufficient cause for rejection and the underlying disease, if not entirely disregarded, is at least looked upon as a matter of but small moment. In this manner mistakes are made upon both sides. No greater error can be made than to look upon every case of albuminuria as Bright's disease, unless it is to regard every case not accompanied by albuminuria as not being Bright's.

It has been estimated that about one-sixth of the applications for life insurance (ordinary) are refused, all causes being taken into consideration. At least one-fourth of these rejections are based upon the presence of albumin in the urine. It is preposterous to assume that one twenty-fourth of the number that apply for life insurance are afflicted with nephritis; we must always be on the lookout for other explanations than irreparably damaged kidneys to account for our symptoms. Nor must it be forgotten that albumen may exist in the urine in several forms, of which serum albumin is the most important, responding to the usual rough tests applied by examiners. Again an admixture of urine with substances containing albumin, blood, seminal and purulent fluid, will throw down a white cloud to the heat and nitric acid test just as readily as will a chemical solution of albumin in urine. Here enters a first plea for microscopic examination in all cases where the slightest trace of albumin is found. A small amount of any of the above abnormal admixtures might and, as a matter of clinical observation, frequently does escape detection on macroscopic examination, yet even such a small amount may cause a slight albuminous reaction, a reaction very like that of chronic interstitial nephritis, the disease which so slowly but surely carries off such immense numbers of the race. One's doubts as to the existence of such abnormal constituents as pus cells, blood corpuscles or spermatozoa in the specimen under consideration, will be at once dispelled by a few minutes use of the centrifuge and microscope. When we reflect upon the large number of pathologic conditions which might result in the pouring out of blood or pus, or both, into some part of the genito-urinary tract, especially when we remember the great prevalence of urethritis, simple and specific, acute and chronic, we are not much surprised at the frequency of albuminuria; indeed, we are rather inclined to feel correspondingly encouraged at the lessening of the number of cases of possible Bright's. Of late years the increasing frequency of life insurance among women, while not liable to increase the average of insurance mortality of Bright's, yet certainly must hold its own as regards the ratio of albuminuria. Menstruation, endometritis and vaginitis, would easily maintain the standard. From this it can readily be deducted that uranalysis in a female is not of much value unless the urine is obtained by means of the catheter.

Albuminuria in its present day aspect is divided by clinicians into two types, the physiologic and the pathologic. The former is a convenient head under which to class cases in which the symptom is transient or intermittent, and in which it occurs, presenting no other sign of kidney or circulatory disease. The albuminuria of pregnancy is termed by the adherents of this class as physiologic in a large number of cases; that it is a frequent symptom among women in this condition is admitted by all who have looked closely into the question, Aufrecht reporting as high as 56 per cent In new-born children albuminuria is common during the first few days of life, but the changes in circulation would readily account for this. Among these intermittent cases, the albuminuria that occurs in bicycle riders is of late receiving deserved attention. Mueller[1] reports eight cases in trained cyclists, in whom, after a fatiguing ride, there appeared an albuminuria which even with the aid of the microscope was absolutely indistinguishable from that of true nephritis. It is interesting to note that after several days of rest the albuminuria disappeared. The urine when examined previous to the ride was free from albumin in all cases but one, while after the ride seven out of the eight showed albuminuria and the majority casts of various kinds. These cases will be referred to again in speaking of the pathologic type. Suffice it to say here that they were regarded as physiologic, by their reporter, on the grounds that the albuminuria was intermittent, disappearing completely on the cessation of the excessive exertion, without apparent damage having been sustained by the kidneys. The ultimate fate of these men might make an interesting contribution to the etiology of nephritis. Vaccination is not infrequently followed by transient albuminuria in subjects who were previously free from the abnormality. And so we could go on adding case after case called physiologic because the albuminuria is transient and is not accompanied by casts. Tyson,[2] in considering physio-

[1] Muench. med. Woch., 1896.

[2] Tyson's Practice of Medicine.

logic albuminuria, writes: "The presence of a physiological or functional albuminuria at the present day is generally conceded. By it is meant an albuminuria which is associated with no other symptoms. There are no tube casts or feeling of ill-health. Such albuminurias are often discovered accidentally, especially by examiners for life insurance. Much care should be exercised in concluding upon the nature of an albuminuria suspected to be functional. In the first place it should be small, not exceeding one-tenth the bulk of urine tested, and though it is not necessary that it should be absent on rising, yet it is a strong point in favor of the functional nature if it is absent at this time and present only after some exertion has been made or on taking food. No tube casts should be in the urine, the urea should be in sufficient quantity, there should be no retinal change, no hypertrophy of the left ventricle, no high tension of the pulse, nor even a suspicion of dropsy. *And this condition should be maintained over a considerable length of time* before the conclusion is arrived at that we have to do with a harmless funtional albuminuria." This latter italicised clause practically settles the question as far as life insurance is concerned. Very few applicants will consent to wait patiently for several months, "on trial," as it were, submitting themselves to the inconvenience of frequent examinations of their urine. If they are not rejected immediately they will soon suspect from the delay that there is something wrong with their urine, and will withdraw their application before it is rejected. No, a company must do one of two things, accept or reject; half-way measures will do much to weaken a company.

It is a fact constantly brought out from insurance offices that cases of albuminuria which have been insured show a large and early mortality. These are selected cases, looked upon as of cyclic albuminuria by the examiners, which latter have returned favorable prognoses. Is it not more reasonable, in light of this fact, to regard many of such cases as in the first stage of that organic change which leads to granular atrophy? Take the instance of the trained cyclists referred to above, for example; a frequent repetition of the exercise which was followed by the appearance of albumin and casts would inevitably bring about organic destructive changes in the kidney substance itself; for we know that if an irritative lesion be exerted upon an organ over a considerable period of time newly formed connective tissue will result, to be followed sooner or later by cicatricial contraction. In the infectious diseases, smallpox, diphtheria and typhoid, the presence of albumin in the urine is of common occurrence, and no one attempts to claim that such albuminuria is physiologic, though it may disappear entirely without sequelæ with the cessation of the original disease, and is not always accompanied by the appearance of casts. Here the specific microbe of the disease or its ptomain is said to bring about changes in the circulating fluid, followed by fever, increased arterial tension, and finally by structural changes in the cells of the internal organs. The kidneys participating in this cloudy swelling, as it is called, the organic changes occurring in the delicate epithelium of the tubules and glomeruli readily allows the transudation of albuminous elements from the blood, which would be rejected were its integrity preserved. This is the main principle underlying every case of albuminuria; some interference with the integrity of that portion of its secreting structure that acts, as it were, the part of a dialyzer—in other words, the epithelium of the tubes. As long as this remains intact, just so long will the non-osmotic albuminous elements be prevented from entering the tubules and eventually the urine; the greater the destruction of epithelium, the greater the amount of albuminuria, provided the tubes do not become obliterated as they do in chronic interstitial nephritis. From this standpoint the pathologist would regard every case in which albumin was present as pathologic, even though pathologic structural changes were few and microscopic. He would look upon any case of transient or intermittent or cyclic albuminuria, not as a physiologic process, but as a pathologic one, in which the ever working silent forces of nature had succeeded in calking the leak, in replacing the diseased or destroyed epithelium; in short, that no such thing as physiologic albuminuria exists; that every case in which this symptom occurs is pathologic and is always accompanied by definite organic nephritic change, though they may be of only microscopic size and are quickly repaired. To quote from Osler,[3] "the presence of albumin in the urine, in any form and under any circumstances, may be regarded as indicative of change in the renal or glomerular epithelium." From a life insurance standpoint, one can not but regard the matter in the same light. When we consider the enormous interests often involved and the frequent crudeness of the urinary examinations, the rejection of cases with albuminuria without casts or other symptoms of nephritis can not be looked upon with surprise, though such rejections might add a powerful enemy to the company to say nothing of the direct loss from his premiums.

As shown above, the presence of albumin in the urine means very little in itself, aside from giving us a strong hint for further investigation, for a considerable amount of albumin may be present and the kidney lesion be slight, or we may have other of the genito-urinary organs at fault. We have but one way of thoroughly understanding the condition and that is by microscopic examination. On the one hand we may have no kidney trouble, yet considerable albuminuria; on the other, we may have chronic inflammatory disease of the kidneys well advanced without the constant presence of this substance in the urine. It is of the greatest value for the home office to know what has been found under the microscope, when albuminuria exists.

In that most common of kidney diseases, that slow inflammatory process in which by the contraction of gradually formed new-formed tissue, the kidneys are reduced markedly in size, chronic interstitial nephritis, gouty kidney, contracted kidney or whatever one may choose to call it, the urine usually presents the following changes: Passage of a larger quantity than normal in the twenty-four hours, a low specific gravity, almost without color; in these albumin may be found only after testing several samples of urine and then only in traces. The heart and arteries would next claim our attention. The presence of an hypertrophied left ventricle without valvular disease, combined with a pulse of increased tension, would be significant. Arterio-sclerotic changes in the radials or temporals would be strong evidence of a similar change in the arteries of the kidneys. One of the most valuable points in the diagnosis of suspected

[3] Osler: "Principles and Practice of Medicine," 1895, p. 768.

Bright's disease, especially of the form under consideration, is a dilated, tortuous, congested appearance of the retinal vessels; pulsation of the retinal veins is also frequently observed. As mentioned above, the urine may at times be free from albumin, but continued examination will eventually prove its existence. The difficulty lies in the fact that even in policies calling for many thousands of dollars but one urinary examination is made, or if there are two examiners on the case, both obtain a specimen passed at approximately the same time. Undoubtedly, large numbers of cases of beginning atrophic cirrhosis are passed every year in this manner. In the incipient stages of this disease, probably the symptoms above mentioned would not be sufficiently in evidence to provoke comment, unless we except the retinal changes. How few of us, however, outside of specialists, are able to make a satisfactory ophthalmoscopic examination! One interesting fact in regard to the etiology of Bright's disease must not be lost sight of: That the form known as chronic interstitial nephritis rarely occurs before the age of 40. Now what shall we do in cases where an albuminuria has been found or even when albumin is not present? It seems that the only remedy is to have a microscopic examination made in every case in which the application calls for more than a certain fixed sum, say $2000, provided the applicant is over 40 years of age. Some companies have instituted such a plan when the application calls for a large amount, $20,000 or over. This is a step in the right direction, but the limit should be greatly lowered. Companies would do well in securing this end to appoint in all cities, in addition to their regular examiners, one microscopist, whose sole work should be to make the microscopic tests whenever required by the amount of the application. Such an examiner would be working independently and would not be hampered in the slightest degree by the influence of agents. He would know nothing as to the other findings in the case and his results would stand strictly on their own merits. In this way, too, statistics would be soon forthcoming from the home offices as to the frequency of albumin without casts, casts without albumin, presence of both albumin and casts, and a satisfactory working basis started. In time we could work backward and the poor unfortunates, from a life-insurance standpoint, who have habitually slight albumin without casts, instead of being universally rejected, be allowed insurance, though perhaps at an increased premium.

FALLACIES IN THE PHYSIOLOGY AND FUNCTIONS OF THE LABYRINTH.

BY M. A. GOLDSTEIN, M.D.

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ST. LOUIS, MO.

The great advance made in our knowledge of the physiology and pathology of the external and middle ear during the past decade has far overshadowed, in quality and quantity, the results which have been obtained in the investigations of the internal ear. Perhaps this may be due, in part, to the relative infrequency of diseases of the labyrinth, and the consequent insufficiency of data; perhaps also to the difficulties which often present themselves in making correct diagnoses of many labyrinthine affections. On the other hand, we have many series of valuable clinical observations on diseases of the internal ear, without being able to determine the pathologic changes which have taken place; again, we have interesting postmortem findings in labyrinthine diseases without the support of proper clinical data. Thus, much of our information on the subject is but the combination of hypotheses and possible conditions, lacking the strength of absolute scientific data and certainties.

Concerning our knowledge of the anatomic and functional changes and the diagnosis of diseases of the internal ear, we are still on the threshold of our subject, notwithstanding the many interesting reports of cases and clinical observations furnished by experienced observers in every section. The physiologic significance of the semi-circular canals has been the subject of considerable difference of opinion, and many of the experimental data now at our disposal are so conflicting that our results have been based on a rather indefinite foundation.

The former theory, that the angles which the semi-circular canals form, arranged perpendicular to each other, thus accounting for their capability to determine the direction of sound, seems to have been entirely discarded. More interest centers about the functions of the semi-circular canals as organs of co-ordinate movement. The fundamental experiments upon which this theory is based, were first performed by Flourens. He repeatedly observed, after division of the semi-circular canals in pigeons and rabbits, considerable motor disturbance, which convinced him that these canals were the central and control organs for co-ordinate movement.

Careful investigators however, operating along the same experimental field, have arrived at decidedly different conclusions. Thus Goltz, Crum-Brown and others, look upon the semi-circular canals as the "organ of the sense of equilibrium;" Cyon designates them the "organ of the sense of space"; Löwenberg refers the symptoms mentioned to a reflex transmission of the irritation caused by the injury to the motor nerves of the thalamus opticus. Opposing these theories, Moos, Böttcher, Baginsky and Tomaszewicz infer that all disturbance after injury to the semi-circular canals proceeds from a simultaneous injury to the cerebellum. Many of these conclusions have been reached by experiments conducted on some of the lower mammalia, and the great variation in the data acquired would tend to establish, even without further proof, the uncertainty and fallacy of these several theories.

Permit me to add my own clinical observations relating to the functions of the labyrinth, which though limited, I have nevertheless been able to repeatedly verify.

In April, 1895, I reported my clinical data of an especially interesting case of exfoliation of the labyrinth. The case was that of a young negro boy, 6½ years of age, who developed a suppurative otitis media after a severe acute rhinitis. After nearly two years of profuse and continued suppuration, during which time no complications had arisen, the patient came under my observation. The unfavorable aspects of the case had now presented themselves. Mastoid infiltration and inflammation were marked, and complete facial paralysis of the affected side was demonstrable. On operation the greater portion of the outer bony area of the mastoid was found to be a softened,

necrotic mass, and could have been more easily ladled out with a spoon than removed with a curette.

In the course of five weeks, five sequestra were successively removed from the temporal bone. The largest exfoliated mass contained nearly the entire bony labyrinth. The cochlea was almost completely exfoliated; the vestibule with the ampullæ were plainly visible, also a considerable portion of the semi-circular canals, together with a honey-combed mass of mastoid cells. After the removal of the last sequestrum, the patient was convalescing rapidly, and January 5, two months after operation, he was presented at a meeting of the St. Louis Medical Society. He was then bright, active and in good spirits. Three weeks later, a rapid, general decline ensued and the patient died shortly afterward of acute, miliary tuberculosis.

Unfortunately, permission was not granted for a complete postmortem, but, the right temporal bone was removed, and the involved area carefully inspected. Examination of the affected temporal bone, after its removal, corroborated my description of the necrosed and exfoliated areas.

Circumscribing the region of the osseous external auditory meatus, and involving the mastoid and squama, with a radius of about three-quarters of an inch, was a necrotic zone with irregular, but well defined margin. Designating this as the base of a long, cone-shaped canal, we note an axis of about two and one-half inches in length, directed inward, downward and backward, with its apex merging into the Eustachian tube. This cone-shaped sinus. through which the exfoliated bone masses were removed, was lined with quite firm, closely meshed granulations. All landmarks of the osseous meatus auditorius externus and cavum tympanum had disappeared. Of the petrosa, the superior wall and part of the posterior portion of the meatus auditorius internus still remained intact. Examined while fresh, the portion of the nervus acusticus, lodged in the depth of this canal, was to all appearances normal in color and consistency. I desire to especially emphasize this fact to substantiate later observations.

After removal of the bone, the exposed cavity was carefully examined, with special stress laid on the cranial areas in direct relationship to the necrosed bone. On the periosteal surface of the bone still remaining, numerous erosions and irregularities were noted, yet the dura mater at all points was perfectly firm and intact. With the existence of a disseminated and rapidly progressing tubercular process, our anticipations of the presence of a tubercular meningitis might have been well founded; the most careful and detailed search, however, failed to reveal any meningeal lesion whatever.

In the first place, I would offer as a proof of the fallacies of the present accepted theories concerning the functions of the semicircular canals, that this patient walked into the assembly hall of the medical society with a thoroughly steady gait and a perfect sense of direction, walking with head and body erect, and turning to the right or left as indicated by members of the society conducting the examination, and all this while the exfoliated labyrinth containing the cochlea and semicircular canals, taken from his right temporal bone, was lying on the table awaiting inspection.

The postmortem examination substantiated my conclusions that not only the osseous semicircular canals had been entirely exfoliated, but no vestige of even a membranous labyrinth remained, so we are justified in concluding that it also had been destroyed.

Walking and standing tests were repeated frequently; varying the same in every conceivable way by blindfolding the patient, testing with eyes closed, permitting the patient to walk under the influence of loud noises, etc. The results were always positive, the gait firm and steady, position of the head erect, and the power of equilibrium and sense of direction preserved to a nicety.

In presenting these facts it is not my purpose to promulgate any new theory concerning the functions of the labyrinth, but to emphasize the fact that many of our ideas thus far conceived, will admit of decided revision.

Concerning the functions of the cochlea, much of our present information is based on hypotheses. By the labors of Helmholtz, Corti, Ranke, Hensen, Hasse, Exner and others, great progress has been made in establishing the functions of the delicate structures of the labyrinth, yet even Helmholtz, whose pioneer work in the physiology of the ear has contributed so many interesting and valuable data, admits the possibility of error in these observations.

In the literature of otology, necrosis of the cochlea or part of the bony structure of the internal ear is not of infrequent occurrence, but an exfoliation of the entire labyrinth in one piece is indeed very rare.

Sexton, Gruber, Guye, Bezold, Rueda and others have seen and reported cases where exfoliation of the cochlea alone has not been attended with total loss of hearing on the affected side. Sexton even emphasizes his observations by the statement: "I fancy no one disputes that in one of my cases marked hearing remained." These cases are, in themselves, substantial clinical evidence that the cochlea is not an absolute essential to hearing. In these cases, however, only the cochlea had been exfoliated, the other structures of the labyrinth remaining intact.

I desire to advance one step farther in the conclusions thus far reached. I maintain that in the case which I have reported, of exfoliation of the entire labyrinth, a very fair degree of hearing was retained in the affected ear, and herewith present for consideration the tests and observations recorded. I have been thoroughly cognizant of the difficulties and responsibilities attending an effort to substantiate so radical a statement, and have necessarily adopted the most careful methods and delicate tests to convince myself of the accuracy of my conclusions. The most serious obstacle to contend with was the exclusion of the healthy ear from the sound tests which were instituted. In the majority of the tests made I adopted the method suggested by Dennert and Lucae, with modifications. In determining what degree of sound perception still exists in an affected ear in a case of one-sided deafness, the healthy ear of the patient is stopped, turned toward the source of sound and the tests then made, the affected ear being alternately opened and closed. Whatever difference in the hearing then elicited, is attributed to the affected ear.

A more delicate modification of this method has been successfully used by Burnett. The patient is so placed that the affected ear is toward the operator. The healthy ear (not the ear to be tested) is plugged. With the affected ear open, hearing tests are then instituted. Having thus reached the apparent limit of the hearing power of the affected ear, that ear is

then closed, and the tests continued. If the closure of the deaf ear causes no difference in the hearing distance already obtained, it is fair to conclude that whatever amount of hearing exists is not due to passage of sound through the external auditory canal of the affected ear turned toward the test. In such a case the conclusion must therefore be that sound has reached the brain through the agency of the healthy ear. If, however, the stoppage of the affected ear is accompanied by an absolute inability to hear sound tests, it is again rational to conclude that this difference in the hearing power must be attributed to the affected ear. Thus, the final conclusion: "Whatever is heard just as well with the deafer ear stopped as when open, the better ear remaining stopped throughout the testing, must still be heard by the better ear through the head; but whatever is heard with the worse ear open, the good ear being stopped, must be attributed to the worse ear."

The question might be asked, Why can not sound be conveyed to the deaf ear through the head, if it is conveyed to the better ear which is stopped and turned away from the sound source? The reply would be that an ear which, either when stopped or open, perceives no difference in sound conveyed by the meatus, is not sensitive enough to hear sound conveyed to it through the head.

In the consideration of the case at hand, bone conduction tests by aid of tuning forks were excluded, as they were deemed less delicate for a differentiation than aerial sound conduction. Furthermore, as our dealings were directly with an exfoliated labyrinth, the tuning fork, relative to bone conduction, was practically of no value.

The following tabulated notations will indicate clearly the conclusions reached in hearing tests of the affected ear:

HEARING TESTS.	Hearing capacity with both ears closed.	Hearing capacity with affected ear open and good ear closed.
Loud conversation	300 cm.	900 cm.
Whispered conversation	30 cm.	90 cm.
One hundred and fifty centimeter watch	5 cm.	15 cm.
Politzer's accoumeter, designated by patient as a loud ticking watch	15 cm.	35 cm.
Galton whistle; pitched high	30 cm.	60 cm.
Differentiation in sound of C from C^4 tuning fork	8 cm.	35 cm.
Musical notes of a loud sounding-harmonium. Differentiation of C (3d octave) from C (5th octave)	35 cm.	90 cm.

In the execution of the enumerated tests the patient was blindfolded; the plugging of the meatus was done by a competent assistant, the forefinger being used as a tight plug. Taking into account the age of the patient and all tendencies to a possible misrepresentation of the hearing capacity, the tests were repeated at frequent intervals with many variations, yet the tests proved doubly valuable, owing to the demonstrable accuracy of the patient's statement.

Thus, the conclusions which have been logically and carefully reached tend to establish the fact that this patient, with an exfoliated labyrinth, still retained partial hearing faculties in the affected ear.

Pathologically, we deal in this case with a destruction of the peripheral or terminal filaments of the auditory nerve, as indicated by necrosis of the cochlea and semicircular canals.

Physiologically, we know that the auditory nerve, when stimulated either at its origin, in its course or at its peripheral terminations, gives rise to sensations of sound. We also have the report from several authentic sources that after exfoliation of the cochlea considerable hearing power may be retained by the affected ear. As the peripheral apparatus is hereby destroyed, how is the function of audition carried on?

We know that perception of light does not depend entirely on the presence of rods, cones and lenses; walking along in a dark corridor and suddenly coming in contact with some external object causes an impression of a bright flash of light. Nor does the sensation of taste depend exclusively on an exercise of the physiologic functions of the tongue; when a galvanic current is applied to the face we readily experience a metallic taste in the mouth.

We even speak of "seeing sounds" where the impressions of musical tones are interpreted by certain individuals as colors of variegated hues; and of "nasal vision," where the nose, in part, performs the function of the impaired or absent eye.

I would illustrate with these examples that even the nerves of special sense may have compensatory functions. Why then can there not be such compensation of the nervus acousticus?

In the postmortem examination it was found, macroscopically and microscopically, that the portion of the auditory nerve still retained within the internal auditory canal was, to all appearances, normal and healthy.

Is it not possible that sound waves could have been conducted through the large sinus left by the removal of the several sequestra, and could thus have been impinged directly on the stump of the exposed auditory nerve and transmitted directly to the brain?

3702 Olive Street.

SOCIETY PROCEEDINGS.

Associated Health Authorities of Pennsylvania.

Fifth Annual Meeting held at Lancaster, Pa., May 18 and 19, 1898.

FIRST DAY—MORNING SESSION.

Prof. E. O. LYTE, Principal of the Millersville Normal School, made an address of welcome, which was responded to by Prof. G. G. Groff, President of the State Board of Health, who was introduced by First Vice-President Crosby Gray of Pittsburg, Superintendent of the Bureau of Health of that city.

The first paper was by Prof. R. C. SCHIEDT of Franklin and Marshall College, on

THE RATIONAL TRAINING OF CHILDREN A PROBLEM IN PEDAGOGIC PHYSIOLOGY.

The subject was treated exhaustively, not only from the standpoint of the teacher, but from that of the psychologist and the physiologist. He said that his results differed from those obtained by the German and French psychologists and because of the difference in the children of different nationalities. The American boy is superior to any other on the face of the globe. The Professor has had splendid opportunities to observe the difference in the physical condition of children through his connection with various German institutions. It is generally agreed that we are living in an age of unusual activity that has placed its stamp upon the children of the land. Education is looked upon as a panacea for all the ills the body politic is heir to, and the responsibility of the future of the race is placed upon the schools. As a matter of course, in a land like ours, we are confronted with a maze of conflicting opinions. But is it actually true that the children of our age are in such a deplorably nervous condition? I am inclined to think not. I have made extensive experiments in Berlin and America to study the nervous condition of children. By means of a machine I measure the degree of fatigue under which any individual may be suffering. In Germany the best

pupils exhibited only the slightest trace of nervousness. Some nervousness was traced to the use of alcohol and an insufficient amount of sleep. Only 23 per cent. of those examined were refreshed by gymnastic exercises. In the schools of Lancaster, the experiments showed 15 per cent. without any nervous fatigue. These experiments were made on different days so as to obtain different atmospheric conditions, with widely varied results. On a clear day 90 per cent. of the boys showed a good condition before the school opened. At 3 P.M. 15 per cent. were more refreshed than when they started to work in the morning. But 7 per cent. were unaffected by atmospheric conditions. The large number of 43 per cent. exhibited abnormal fatigue. The experiments on the whole were very gratifying as far as the children of Lancaster were concerned. These show that alternate periods of study and relaxation, as is the practice in Lancaster, is the best plan to pursue. The 43 per cent. showing abnormal fatigue should have more systematic out-door exercise, otherwise the results can not be satisfactory to teacher or pupil. Intellectual activity is a prime essential in the development of a sound and vigorous body. He advocated, most earnestly, indulgence in out-door exercise; would abolish the afternoon session and have a long morning session with a number of recesses. With the introduction of manual training in all schools each child will thus be afforded a better opportunity to develop its individual tendencies. In the class room the pupil is but one of a dozen, and the only virtue adduced therefrom is obedience, which the child should have learned at home. Physical exercise should be divided into three classes, muscular, cutaneous and inspiratory.

A discussion followed by Drs. Benjamin Lee, Secretary of the State Board of Health of Pennsylvania, J. Madison Taylor and S. D. Risley of Philadelphia, each commending and agreeing with the points made by the reader.

Miss DORA KEEN, Chairman of the Committee on this subject appointed by the Public Educational Association of Philadelphia, had prepared a paper on

MEDICAL INSPECTION OF SCHOOLS,

which was read by Dr. J. M. Taylor.

In October, 1896, Dr. C. F. Robert, Sanitary Superintendent of the New York Board of Health, sent a communication to the board, setting forth his belief that the greatest source of the transmission of infectious and contagious diseases among children was through the contact with one another at school, and that this transmission would best be overcome by systematic daily inspection of the schools by medical inspectors. Such inspection had its first trial in the parochial schools of Philadelphia some years ago, and was abandoned owing to a mistaken opposition. This city was ahead of the times. Boston soon seconded her, and now New York and Chicago have adopted this plan. It has proved the value of the work, and abroad Brussels has adopted it, and Boston is getting the credit of it. Providence, Baltimore and Milwaukee are agitating the question. Only yesterday, the Philadelphia Board of Health took the proposition of the Public Educational Association into consideration, referred it to its sanitary committee, and appointed a hearing for May 31. While the inauguration of this work comes properly within the function of the city boards of health, with whom it lies to organize and conduct the work, yet no less does it claim the interest of physicians and teachers. To assure themselves of the value and necessity of the system the Boards of Health of New York and Boston conducted preliminary investigations. The latter published tables by months of all cases of diphtheria in nineteen years in that city. There was a variation of 1600 cases reported in any two months and the smallest numbers were during the summer vacations. The total for nineteen years was 3339 cases in January and 2537 in June, as opposed to 1765 in August. So with scarlet fever. Records for twenty years showed 3107 cases in January and 1885 in June compared with 1208 in August. An example of the protection of the community by the Boston plan was shown in 1897 in an epidemic of diphtheria. A primary school of forty pupils had fourteen attacked in eighteen days, all from one room. Seven were discovered by a medical inspector, three of these by cultures. All suspicious cases were dismissed and recommended to the care of the family physicians. The next morning everyone was examined, many cultures were taken, the class was dismissed and the rooms disinfected and cleaned. For ten days after the return to school everyone was examined when first the class assembled in the morning, and no child absent with any suspicious symptoms was allowed to return till it was proved safe by a negative culture. The result was that not a single case resulted beyond those known to have been infected at the time the epidemic was discovered. Similar experience occurred with scarlet fever in the service of the same inspector shortly after, in which all eleven cases resulted from the presence of one pupil, whose illness had been diagnosed German measles. In New York the best results were obtained by securing a list of the absentees where a case of contagion had occurred, and visiting the families to learn the cause of absence. Eighty-five families visited showed fifteen cases of scarlet fever and nineteen of diphtheria, in which the first case was a school child. The statistics seemed to show that many cases of diphtheria went unnoticed, and the same to a lesser extent with scarlet fever. Children sent home with a "sore throat" fail to call in a physician, and return to school when feeling well. Thirteen out of twenty cases would have remained unknown if the absence list had not been examined in one report of scarlet fever. Of these, four did return and would have remained to spread contagion if they had not been known as dangerous. Others were preparing to return, so that the epidemic would have been indefinitely prolonged. In regard to measles, seventeen cases were reported, and upon investigation twenty more were found, which from ignorance had not been reported. Of these, twenty-two had contracted it in school. This evidence was so convincing that application was made for the appointment of a chief medical inspector, with a staff of 150. In both Boston and New York school inspectors are separate from regular medical inspectors. The duties of the school inspector are "to visit the schools of his district daily at the opening of school, examine all pupils whom the principal has found to be ill or complaining, and advise the teacher concerning them; to keep a record of the diagnoses for the custody of the principal, and to forward daily and weekly reports to his chief. He never encroaches upon the rights of the family physician. He is simply to examine all children that appear to be ill, point out the need of treatment, and to exclude contagious cases from the school. A courteous note is sent to the family physician stating the cause of exclusion. Blanks, wooden tongue-depressors, culture outfits, etc., are furnished at the central office. The inspection consumes very little time and creates but little confusion. Results: In Boston, 1896, 8964 were examined, 1156 too ill to remain in school; 3934 were suffering from oral and respiratory diseases, 267 from specific contagious diseases.

In one school parasitic diseases of the head existed in 74 per ent., and 7 per cent. were very badly affected. In Chicago so much benefit resulted from the inspections that it was determined to continue the work to the full extent of the resources. During four months 350 inspections of 233 schools were made, 1417 cases of diphtheria and 306 of scarlet fever located. In New York 63,812 were examined in the first three months, 4183 or 6 per cent. were excluded for contagious diseases. Parasitic diseases of the head numbered 2627; contagious diseases of the eyes 702. Among a large number of people no dread of measles or scarlet fever is felt and such often oppose the means of prevention.

On the side of defective sight and hearing, preliminary and unco ordinated tests are all that can be reported. This field is an important one, yet no city has yet co-ordinated that work with general medical inspection of schools. The work is worth doing well, but it is a severe piece of drudgery. One specialist says that 300,000 examinations have had very little scientific value. As for methods, it has been shown that a fairly complete examination of both eyes of an individual can be made in three to five minutes. A part of the work can be done by an assistant. Conveniences for the examination can be usually arranged at the school, and may be either in or out of school hours. One thousand children may be set as the limit of one man's work, pretending to be thorough. Many of the alleged studies on record can be used to prove anything and really show nothing. Looking at the results thus far, we find that awakened interest of the community has already greatly improved the conditions for the school child. Nevertheless, near sightedness has not decreased. Large classes and the pressure of changing methods of instruction, force the teacher to a somewhat wholesale treatment of pupils, while the recent investigations of 2,000 children of the Philadelphia Teachers' Society for Child Study purports to show 54 per cent. suffering from defective vision. Some cases were so serious as to interfere with the intellectual development of the pupils. An interesting statement of results showed a majority were not aware of any defect of vision and the strain on the mechanism of the eye was going on unnoticed. It is a system of education fruitless of real development that attempts to force all children alike, regardless of the fitness for work of the particular child. Philadelphia's contribution to this branch was made by a committee of the County Medical Society under the direction of Dr. S. D. Risley, in 1878. He received the hearty support of the Board of Education and the community. Twenty-six hundred examinations were made in two years. "Many a

school boy idle only at his books, dull only in the recitation room, is so because he finds the continued use of his eyes a painful task," and near-sightedness comes to affect his mental habits and moral character as well as his physical constitution. Extended observation in Europe showed that this trouble increases steadily as the education goes on. In America, it rises from 3.5 per cent. of children 8 years of age to nearly 20 per cent. at 17½ years. In Germany, perfect hygienic conditions of hours, seating and lighting, failed to arrest the increase. The committee of the County Medical Society sought to answer the question, To what extent are our educational methods and manner responsible? The following conclusions were reached: That the possible presence of defective vision should be excluded by examination before entering school; that children enter too young; that the course of study should be so chosen and arranged as to avoid protracted use of the eyes at a near point; that the system of term examinations should be entirely abandoned; that text-books should be of good paper and large type; that the method of writing should be optional; that since numbers of the pupils with the weakest eyes drop out after the first few years a more elastic curriculum that would admit of steady though slow promotion is advisable.

The suggestion of a study of the individual needs of the child brings us to the conscious realization of the opportunities the inspector will see open to his intelligent study. While his primary duty is to seek and recognize signs of contagion, he may find a useful line of study in the incidental detection of defective children. The modern plea for individualism in education seeks to adapt conditions to the child, not the child to conditions. Let us, therefore, look to the results of scientific medical inspection, if we would know how great is the need for special schools for special classes. Europe has special schools; our National Education Association has a branch on special schools, and these already exist in Wisconsin, Chicago, Boston and Providence. Mr. Alexander Graham Bell makes a plea for special schools for the deaf with small numbers and centered at convenient points. Chicago reports eight public day schools for the deaf. Let us hope that an intelligent public sentiment may in time recognize that facilitated work and results to both teacher and pupil justify a demand for special schools for the mental, the physical and the moral defectives. The financial basis of medical inspection must be thought of. Where expense prevents a complete investigation, the work may best begin in the kindergartens and the primary grades. This plan will include practically all children under 10 years of age, and it is among these that the chief danger exists. This applies especially to the kindergarten in which, by virtue of different processes, children are brought into close contact with each other, and use in common a large number of objects liable to become infected. Comparison of the health reports of the cities now practicing inspection shows that an average of about 1000 pupils and three school houses is the capacity for work of each inspector. To be thorough, the work should include charity schools and day nurseries, quite as much as the public and parochial schools. Boston's annual pay to each medical inspector is $200; that of New York $300; making the total cost to New York $45,000 per annum, irrespective of report blanks, officework and incidentals. In connection with this outlay, however, it must be remembered that the incident control over contagion causes a constant decrease in the work of the district medical inspector. The school work may thus in time become a paying investment. Coming next to the sanitary and hygienic side of the subject, the control that will be obtained over contagious diseases will redound to the credit of health boards and repay the community for all that it may cost. It has been estimated by one physician that 70 per cent. of epidemics might be prevented by inspection. There are many diseases upon which the law requires no report, parasitic diseases of the head, contagious diseases of the eyes, follicular tonsillitis, oral and respiratory diseases, and further mumps, whooping cough, measles, consumption and chicken-pox. Medical inspection will detect a large number of these. While the main purpose of inspection is the preservation of life, yet the community has a right to demand the best possible protection against the spread of the above named diseases and the consequent interruption of the school life of the child. In a very large number of cases the mildness of the disease or ignorance has prevented its recognition, etc.; the child nevertheless was in a condition to spread contagion. To quote Dr. S. H. Durgin, the Boston pioneer in the work, a child with an unrecognized case of diphtheria, not attracting attention, may attach infective matter to the desk, chair, books, slate, pencil, penholder, sponge, drinking cup, door knob, window sill, banister, wainscotting, or to anything which he may handle or touch after using his fingers about his mouth. The fact that these things may become infected with diphtheria in this way has been conclusively shown in the laboratory by Prof. Ernest. This statement would seem to substantiate a plea for simple instructions and facilities for disinfecting purposes in the schools. The far-reaching effects of inspection can hardly be over-estimated. In Chicago, 744 indvidual cases of diphtheria brought to light 2619 cases at home, and 231 cases of scarlet fever disclosed 745 cases at home. Inspection should begin in the old school houses, as the number of sick children from these is greater than from the new buildings. If the School Inspector is alive to the possibilities of his work, full information may be incidentally gained as to defective conditions of school life and particular defects from time to time will be brought to the attention of the authorities. It will suffice to enumerate the conditions to which attention should be directed: Overcrowding, defective heating, plumbing and ventilation, dark basements, insufficient and uncleanly sanitaries, seating and school furniture, recess periods, overstudy and grading of pupils.

The medical profession quite generally, through the journals, have suggested or endorsed the movement for school inspection, and wherever established, the boards of education have co-operated in the work. After two years and a half of test, Boston reported the plan constantly growing in favor with the medical profession, among the teachers, and in the community at large. When organizing the work in New York, the Board of Health took the wise step of giving a few explanatory lectures to the school inspectors. It is hoped that a movement to institute the work throughout the State may result from this presentation of the proven value.

Discussion followed by Prof. W. W. KEEN of Philadelphia, who spoke from the sanitary standpoint.

He said that the State owed two duties to its children: That they should have a good common school education and that, as far as was possible, their health should not be endangered in school. In order to attain the former, compulsory school attendance had been provided by law. We had no right, however, to force children to go to school unless we protected them from infection of some of the most loathsome and deadly diseases. Compulsory vaccination provided against smallpox, but against diphtheria, scarlet fever and a large number of less deadly diseases no provision was made, unless there was a medical inspection of schools. Any child, therefore, was liable to be brought in contact with such diseases without any possibility of escape. It might be objected that these children could not be very sick if they were able to go to school. To this he replied, that at the beginning of many such disorders, and at the end, before health was completely re established, such children would be perfectly able to go to shool; nor must it be supposed for a moment that only the serious type of cases was dangerous. A very mild case of scarlet fever in one child could easily give a fatal attack to another. An attack of diphtheria so slight as not to keep the child at home, much less in bed, might breed in the throat of another child the severest form of the disease.

Most of the epidemic diseases which are contagious arise in childhood. It is therefore particularly important that children of school age should be protected from them. The only way at present of having them protected is through reports to the board of health. But this does not meet the case entirely. There are a large number of diseases that physicians are not required to report, such as measles, whooping cough, chicken pox and the like, and a very considerable proportion of children attacked with these diseases succumb to them. The death rate in measles varies from only 2 or 3 per cent. up to 20 per cent. in severe epidemics. In 1880, 11,102 children died of whooping cough in the United States. Besides this, very many of the dangerous diseases which ought to be reported, are not reported because of the very mildness of the cases, when parents do not think it needful to call in a physician, and in others from the ignorance or wilful neglect of the parents, who endanger not only the lives of their own children but those of other people by not securing medical aid. The rich send for the doctor in the slightest illness. The poor often, from motives of economy, delay till they *have* to seek medical advice. Inspection of schools remedies most of these sources of mischief.

The figures given in the paper were very striking: In Chicago, in 744 cases of diphtheria among children at school, when the absence list was consulted and all families of absent pupils visited, it was found that 2619 cases of diphtheria existed at home, which would not have been revealed but for the school investigation; and similarly, 221 cases of scarlet fever in school children revealed 745 home cases. These home cases of diphtheria and scarlet fever were not only a danger to the school children, but to the entire neighborhood in which they existed.

Dr. S. D. RISLEY of Philadelphia—The systematic medical

inspection of our schools, not only as regards the hygiene of the school house, but the examination of the individual pupils for the purpose of excluding contagious and infectious disease must commend itself to the judgment of every thoughful citizen of our great commonwealth. At first sight, the problem of school inspection seems not only wise and necessary, but its execution very simple. When carefully considered, however, in all its phases, it grows in complexity, and difficulties at first unsuspected are confronted.

The primary purpose of school inspection is to exclude temporarily all children affected with forms of disease which may be communicated to others. It is unquestionably true that a cursory inspection of the throats of the children would exclude a large group of infectious diseases, either in their incipiency, or when present in mild form and their real nature not suspected by the pupil or his parents. Systematic examination of this kind with carefully preserved records would soon prove of great scientific value as showing the possibility of warding off epidemics of measles, whooping cough, scarlet fever and diphtheria.

A careful study of the problem of individual inspection of schools leads us much farther afield than the simple exclusion of infectious and contagious disease. It is reasonable to expect that some degree of physical deterioration will result from depriving children of the freedom of the nursery and playground and subjecting them to the confinement and tasks of the school room; but observation has shown that a considerable percentage of those who enter upon the educational process in apparently good health soon manifest impaired general vigor, acquire distorted spines and develop near-sightedness. It is plainly the duty of those in authority to prevent these misfortunes as far as possible. It may not be generally known that modern school hygiene has grown to its present state of advancement through the individual examination of children for the purpose of discovering the cause of the steady increase in the percentage of near-sightedness as they advance in their educational process. It was at first supposed that this increase was due to bad hygienic environments. Attention was then directed to the quantity, quality and direction of the light in the school room, and to the proper relation between desks and seats. This led to a most elaborate study of the mechanics of sitting, and to extensive measurements of the different parts of the body in order to determine the suitable relation between the height of desk and seat. The print in the text-books, the script used in writing, and the position assumed by the pupil were all subjected to the most careful scrutiny. These elaborate studies in different parts of the world, by many observers, led to great reforms in school house architecture and in the furnishings of the school room, while the examinations of the children's eyes served not only to verify the fact of the steady increase in the percentage of near-sightedness, but demonstrated the relation between that and disease of the membranes of the eye. It was reserved for observations made in the Philadelphia schools to demonstrate that the inflammation upon which the near-sightedness depended was due to the presence of certain congenital defects in the eyeball, which necessitated a constant strain upon the organ of vision during school work; that therefore no child should be admitted to enter upon his school life until the eyes had been examined, when if one of these congenital defects were discovered, he could be sent back to his parents with the advice to have the defect corrected before admitting the child to the school room.

This was a distinct advance in school hygiene, the importance of which can not be overestimated, and was the direct outgrowth of individual inspection of the school children's eyes. It is altogether probable that were systematic inspection adopted in other lines we would see equally important advances made in the science of school hygiene. Most parents in seeking to enter a child at either our public or private schools have considered only the fact that a suitable age has been reached, no thought being given to any other requirement. That the child is in poor health, that it may have defective vision, impaired hearing, or may be mentally defective, are questions that have never for an instant been considered. The only thought is that the child is old enough to go to school. The point in contention in these remarks is that it is the duty, not so much of the health authorities, as of our school boards to subject all new pupils to a rigid individual inspection, as to the condition of their general health, the sharpness of vision, acuity of hearing, and their probable mental condition. At the beginning of each school year all of the former pupils should be re-examined. As regards the general health the requirements of the school board might be met by a certificate of good health from the family physician. This would be in the interest of both child and school. It is idle to expect a sickly child to bear safely the same burden of toil and anxiety which is placed upon the shoulders of his healthy companions. While in some cases it might be wise to exclude the feeble child from school until in better health, there is a large group of physically weak or otherwise defective children, for whom special provision should be made in the required curriculum. Individual inspection should detect these cases and place them in the provisional class for which they are fitted. In it would be placed many children with defective eyes or ears, and with impaired general health. Their progress in school would be steady, but not so rapid as that required from their more fortunate fellows.

As it is at present certainly in our public schools, it is too often a survival of the fittest, the weak and unfortunate being compelled to drop out of the race. The individual inspection should cover, therefore, not only infective disease but search for impaired general and special functions, especially of the eyes and ears. Under no circumstances should any child with purulent discharge from the ears, or inflamed eyes, be admitted until subjected to expert examination; or if the vision is found defective, or the hearing impaired, they should be sent home with a note explaining to the parents how these defects must handicap them in their work at school, and urging them to seek professional advice. For this examination of the eyes, expert skill is not required. It is a simple matter to determine whether each child enjoys a normal acuity of vision or not. This procedure is not the best that can be devised but it meets the practical requirement of the case, and for many reasons is probably the only feasible plan. It would cost but little, and need not awaken the opposition of the parents or the family physician, both of whom are apt to be sensitive about any interference with their prerogatives. As regards the mentally defective, every educator must soon learn that these are not to be found only in the institutions for the feeble-minded. Medical or expert inspection on these lines is an exceedingly difficult and delicate problem, but nevertheless important. Mental defect declares itself to expert observation in many ways. Not only in dulness with books do we detect mental feebleness, but in bad habits, bad temper, incorrigibility, cruelty to playmates, moral obliquity, or even moral imbecility are often signs of hopeless congenital mental defect which should exclude the unfortunate individual from association with normal children, upon whom their influence is always deplorable, and their presence often dangerous. It is true that in some degree these signs are, many of them, the evidence simply of a defective home training, but it is equally true that many boys or girls who are regarded by their parents and teachers as simply bad, are hopeless defectives, and should be excluded from our schools and sent to institutions designed as training schools or asylums for the defective. Such children are often fine appearing, cunning and bright, and the teacher naturally supposes that they could learn if they would, but find to his disappointment that they add only to their store of craftiness. It is from such that our criminal classes are largely recruited. While still in school, the incorrigible pupil should instead of punishment be subjected to expert examination, and their parents or guardians frankly advised of their duty, provided the child is shown to be a member of this unfortunate class. The far reaching importance of this, in that it places these defectives under State control, will occur to the thoughtful.

While such inspection as has been suggested would unquestionably be of great value to the school children and to the community, great care must be exercised in the method of their adoption and the manner in which the inspection is made. School boards and boards of health are important institutions, but they must not be permitted to invade the domain of private rights, nor should they permit themselves to be drawn beyond their legitimate and proper functions by the specious pleas made not so much in the interest of public health as for the gratification of private ambition, or a desire for publicity. Little by little, almost unnoticed dangerous and arbitrary encroachments may be made by such excellently disposed gentlemen as compose our Board of Health, until we find ourselves on the border of State or municipal socialism. That it is proper that many things should unhesitatingly be surrendered to the State is set forth in the foregoing remarks, but we should be cautious as to the method of the surrender.

Dr. J. M. Taylor of Philadelphia said—It is not expected that the teacher will become an expert in differentiating the forms of defective children, nor, in the strict sense of the term, be able to pick out or label the kinds of defects. That is entirely the duty of a physician and can only be done by one of sufficient clinical experience. Once the child has come under suspicion and been separated from the others the physician can do this thing. Then, if he finds himself unable to exactly differentiate, again an expert should be called in. The

kinds of children which will show defects are many, and some of these defects may be only temporary and yet the deficiency or disability be so marked as to render the child unfit for association with the others so far as competitive work in the same lines and to the same degree is concerned. Many children who present themselves in a school for the first time are in a condition of lowered intelligence from the simple cause of malnutrition, living a life of poverty or other defective hygiene. They present a condition of insufficient nourishment, anemia, and are weakened in many or all organs. They may have been subject to household demands, have been made to labor and are in that condition of fatigued state which Professor Schiedt has so admirably portrayed. They may have just recovered from illness, or may be in a condition of chronic disability from many states which should be recognized and treated by a physician. Often these children will be restored by a few days' rest in bed or a period of hospital care to the average of intelligence and alertness. They can then rank as an average child. Another class of disability, the result of defects in various organs, as the eye, have been alluded to by Dr. Risley; the ear will be spoken of by Dr. Randall, and a number of conditions which the medical inspector should promptly classify and suggest means for relief. A third class of defectives are so by reason of brain insufficiency. These may have been subjected to conditions not likely to develop the brain. Such may be improved in varying degrees. Some may require a special line of teaching. As a subdivision of this class mental states have been warped to one-sidedness. There may be quick observation, deep cunning, many of the qualities which enable the child to go along well enough in the ordinary walks of life, but not enough to progress along the lines of ordinary education as offered in the public school. They may be defective in powers of observation, slow in mental processes, with a fair share of symmetric activity which gives, if properly trained, sooner or later, a good quality of judgment, but only developed in lower lines of mental activity suited to their capacity. Such soon reach their limit of education. Another class will show morbid impulses, restlessness and tendency to do things which the routine of the school can not allow; yet if these were placed where they could get a form of education suited to their needs, they might be made more or less useful citizens. Finally, there is a class of mental defects which are inherently bad with distinctly evil tendencies, dangerous to mingle with other children, who ought to be separated and yet well deserve the most careful education to make them useful and less objectionable members of society.

All these classifications may vary from time to time in the same individual and a child who today or at the end of a certain year has made a fair measure of progress will need to be treated or educated in a different way the following year to bring out the best that is in him. Medical inspection will enable all these points to be elaborated and the work now being done in certain large cities in the maintenance of special schools for the mentally deficient is magnificent work, to weed out from ordinary children those who require separate training, and also for the good of the children who are thus freed from these objectionable elements. Again, those separated, classified and properly trained will do great things, but if left to blunder along with the others would fail to be other than a burden to society. No teacher can be expected to be an expert, it must be a physician. The physician must exercise his faculties for months, even years. The study of children is exceedingly important, demanding the highest qualities of heart, brain and observation. It is to be regretted that most people believe children are easily understood. The inspection proposed will serve as a great economy of lives and capital. To be able to pick out promptly and subject to proper treatment those instances of contagious diseases, etc., will not only save many lives, but prevent spread of disease and enable many to grow up and take their places as bread-winners. Again, by the separation of these cases it will limit such diseases so considerably that fewer inspectors will be needed.

Dr. B. ALEX. RANDALL of Philadelphia wished to lay stress upon the aspects of the matter with which his experience had made him familiar, the examination of the eyes, ears and nose. Now that the school life is made compulsory, it is doubly incumbent upon the authorities to protect the children from the consequences of their own ills as well as from those communicable by their companions. The hygiene of the scholars demands that examinations be made as to their physical as well as their mental fitness for the tasks assigned them; for good school hygiene only means that the surroundings should be innocuous to normal pupils. But study shows that few children even approach a true normal and that a considerable proportion are so far short of it as to take serious harm from their school work. Disqualifying defects should be discovered at the beginning, when they are more likely to be remediable, than later, and threatening contagion noted and guarded against. This means a vast amount of work if well done, and if not is of little avail, or even leads to false security. The mere presence of a set of test letters in the schoolroom will show many that their sight is not up to the normal standard; but in this as in the other directions skilled study is needful to bring more than a fraction of the unpleasant truths to light. Any intelligent person can make many eye tests accurately, unless he insists on varying the methods of examination; in some railroads every new employe is required to show to the non-medical examiner his possession of adequate sight and hearing. But to learn that the eyes and ears are likely to remain good requires the expert medical examiner. Much work done in this direction has been inadequate, yet it may have had much value to the individual examined. My contention is that it is almost as easy to do it thoroughly as to slur it in slipshod manner. Examination as thorough as most specialists make in their offices can be made of the eyes, ears and of the nose and throat in about five minutes per pupil and subdivision of labor may reduce this. Few instruments are required that could frighten a child or in any flaw of sterilization be able to convey infection. Usually the school can afford a fitting room for the work and the individual need lose but ten minutes or less from his routine duties. There is room for objection by silly or contentious parents or pupils, as with regard to vaccination or any other sanitary invasions of individual liberty, but large schools in Philadelphia had the matter carried out annually for years without friction. The main difficulty will be in securing efficient examiners without excessive expense. Considerable experience and technical skill are requisite and those having such are generally too busy to care for the small honorarium likely to be paid. Yet if the work be carefully subdivided it is probable that competent men can be induced to undertake limited amounts of it, principally on the ground of its scientific interest and its value to the public, as they now serve in unpaid hospital positions. Many will not continue it after a year or two of its drudgery; yet the system will grow and perfect itself if carefully supervised and many points now set down by skeptics as impracticable will show themselves not only possible but really essential, and we will later wonder how we could expect to get on without such inspection of our schools.

(To be continued.)

Chicago Gynecological Society.

Regular Meeting April 15, 1898.

The President, Dr. HENRY P. NEWMAN, in the chair.

Dr. W. S. CHRISTOPHER spoke on the

NATURE AND MANAGEMENT OF PUBERTY.

He presented for consideration the proposition that puberty is a period during which force is recognized in a peculiar manner for subsequent use in a special manner. That the factors which interfere with the accumulation and latentization of this force interfere with the subsequent act of reproduction in all its phases, and that those factors, on the other hand, which favor the latentization and accumulation of this force, favor the subsequent factors of reproduction. Reference was made to the scientific contributions of Herbert Spencer, who has shown the antagonism between expenditure and genesis, as well as the antagonism between low nutrition and genesis. The speaker said the proposition that low nutrition and high activity are antagonistic to reproduction or genesis, and the converse, that low expenditure of force and high nutrition are favorable to genesis, is tolerably well established. Examples were given. He said it was unquestionably true that the expenditure of nerve force or physical activity, which goes on in the life of the individual during the generative formative period, was certainly greater than it was fifty years ago. There was no doubt in his mind but what the enormous degree of labor thrown upon girls about the time when they were passing through the period of puberty was greater than it was a generation ago. It was a common thing for him to find high school girls failing in their work, and it became necessary to take them from school or diminish their work very materially in order that they might develop properly. It was about the time they entered the high school, or before, that these changes began to show themselves. He cited the case of a girl, 12 years of age, who last October was taken sick with some trifling disorder. On questioning her, he found that she was constantly tired at the end of each school day, and extremely so at the end of each school week. She was removed from school, with

the result that from October until the present time she had gained considerably in weight, strength and personal appearance, and instead of being a fagged out, miserable mortal, she was now a blooming girl, fully up to her age and all that would be required of her in the future.

Dr. JOHN C. COOK thought that physicians were too careless in the general management of boys and girls during the period of puberty. He said: Girls particularly should be taught to stand up straight and to inflate the lungs in such a manner that the nutrition will be greatly increased by so doing.

Dr. BAYARD HOLMES read a paper entitled

HOW TO RECONCILE MODERN EDUCATIONAL METHODS WITH THE DEMANDS OF HEALTH.

He said the growth of the American girl into womanhood generally began at the end of the eleventh year, or some time during the twelfth year, or at the beginning of the thirteenth year, and it progressed with very great rapidity for a year and a half or two years. The law of growth in the human body was one which had not been always considered in relation to the development of girls. The energies of the body rose and fell in each individual with a certain rhythm. Each swell of physical growth was designed to bring about certain morphologic and functional conditions, and when those conditions were not secured at the time nature was accustomed to bring them about, there was absolutely no possibility of their completion and perfection in subsequent years. The maturity of the sexual apparatus and its function in the girl must be secured in that stage of development known as puberty. It was of all the periods of growth of the woman the most important for her future health. Therefore, it was the one above all others which should be considered in the education and training of the girl. All the intelligence and care that it was possible for teachers and physicians to bestow upon her should be given at that time. Not only motherhood and subsequent health, but sanity and life-long happiness were dependent upon the perfection of pubescent growth and function. It did not seem unreasonable, therefore, that the customs and prejudices of the time should be entirely laid aside in considering the proper education of the girl in and before pubescence. In the first place, it was to be recognized as a fact that our present educational methods, both at home and in school, were productive of imperfect women. The ever-increasing number of cases of breaking down, nervous prostration, dysmenorrhea, sterility and hysteric insanity, both among the highly educated and those who left school and entered "gainful occupations" early in life, was recognized by all.

As our public city schools, and most private schools, were now arranged, the boys and girls were educated together, having the same exercises, the same lessons, the same requirements and the same female teachers. This seemed to him the beginning of disasters. The girls should be at that time separated from the boys, the boys going under the care of men and masculine discipline, and the girls remaining in the care of women of experience and education, who would consider the fact that that increasing sensibility and excitability was a part of the pubescent development, and should not be too strongly encouraged.

In the girls' school in the city the occupations should be less and less desk or book study, and more and more the exercise of the hand and eye and body. The ideal school for the girl would make the schoolroom into a house or home in which all the domestic duties would be systematically taught by actual exercise. The schoolroom for the twelve year old girl would have many stoves for the preparation of at least one meal a day; it would have several bedrooms for the exercise of the art of decorating and preparing the sleeping room. Those domestic services would be performed, not for the purpose of educating good servant girls or skilful housewives, but for the purpose of developing the young girl physically and mentally. The cooking would become the basis of the study of physics and chemistry, as well as incidentally the exercise of English grammar and mathematics.

The preparation of the furniture for the sitting rooms and sleeping rooms would be done with the same educational idea. The sewing and the weaving would be made the basis of the study of the history of culture and civilization, and also an exercise of the lost domestic arts. Those school exercises would be most helpful in developing the body of the young girl by interrupted exercises of great variety and they would develop her mind by giving play to the imagination and by contact with real things, methods much neglected in our present educational system. The girl would become a handy, effective, self-reliant woman. It was possible that she would have no less skill in English composition than was secured by the present method of encasing the girl in a mahogany and cast-iron seat for six hours a day and cramming her by means of the memorizing and recitation method. When pubescence had been established and the girl had become a woman, it was possible that she might be able to withstand the trials and the burdens of our medieval and pedantic educational system and take her place in the last years of the high school or the beginning of the college course side by side with the men.

Women must become productive and independent members of society. Less than one-third of the women of the country were brought up in cities. The surroundings of the country girl were quite different from those of the city girl, and yet they were much influenced by the customs and habits of the great aggregations of people from whom civilization takes its name and inspirations. The country girls were trained as nearly as possible as the city girls were. They were taught to read, write, spell, figure, write compositions and read French and Latin, and despise all sorts of domestic or manual labor.

Dr. W. O. KROHN followed with remarks on the same subject. He mentioned a series of experiments and showed charts giving the relative lung capacity in boys and girls. He said modern educators were seeking to re adjust the course of study to fit the child both as regards physical facts and mental facts. In the matter of exercises they were managed according to growth periods, and there was no period more critical, and one that required so much close observation as the period of pubescence in both the boy and the girl. He exhibited a chart which represented the physical exercises most beneficial at different ages. Exercises at the period of from 9 to 14 years were classed under three heads, viz.: 1. Exercises that bring about incitement to, and the formation of growth. 2. Those which contribute to the acquirement of a graceful carriage or nice walk. It was during this time that the muscles of co-ordination passed through their particular phase of development, and this development could not so advantageously take place at any other period, and those physical exercises which conduce to grace and beauty and ease of posture must be given to the child at this stage of his or her career, in order to reap the advantages to be gained from such exercises. 3. We must have at this period exercises that conduce to practice and to skill. Forbidden exercises were those that conduced to straining of the muscles, and should be avoided because of impending molecular changes at this period. Exercises of endurance should be stopped when fatigue manifests itself. Long continued piano-practicing on the part of the girl at this stage was harmful, if carried beyond the point of endurance.

He said our modern methods of education must be re-adjusted to fit the child rather than the notions of any school board or superintendent, apart from his knowledge of children and ability to frame a logically trimmed, neat, pretty course of study. Teachers were beginning to realize more and more the important point that education must not be acquired at the expense of health.

Dr. ALBERT GOLDSPOHN had in numerous instances ordered girls, between 6 to 13 and 15 years of age, to remain a year out of school, and had observed marked beneficial results from such advice, as for instance, the cessation of excessive menstruation in those who were already menstruating; the cessation of persistent headaches, nosebleed, vertigo and dyspeptic phenomena, and occasionally of persistent neuralgias. He recommends exercise in the open air and the avoidance of sedentary occupations.

Dr. SARAH HACKETT STEVENSON said experience and observation had taught her that it was not the educated women who were the invalids. Before she had undertaken a trip abroad she was told that nearly all of the illness was among American women on account of excessive mental work. During her European trip she saw the dispensaries filled with women who had never crossed the threshold of a schoolhouse, consequently the cause of disease could not be reasonably ascribed to the education of women. The fact of a girl being in school and subjected to a certain amount of discipline at the period of puberty was rather beneficial than otherwise.

Dr. ERRANT believes it is good for a girl to be educated; at the same time the mental strain at the period of puberty, incidental to competition with boys in school, had its injurious effects.

Dr. FENTON B. TURCK spoke of the importance of having a system of dietetics suitable for age, time and conditions of children. The question of malnutrition in school children was the first to confront both medical men and teachers.

Dr. FRANK S. CHURCHILL dwelt briefly upon the importance of not overburdening the child mentally or over-straining its nervous system at the age of puberty at the expense of the physical body. It was of the utmost importance for physicians to encourage outdoor exercises and sports among girls and boys, and get them into the open air as much as possible. He said

that President Eliot of Harvard University had remarked that "the future of the American public depends upon getting the children of our large cities out into the country for as long a time as possible during the summer." This was easy of accomplishment among the children of well-to-do people, but unfortunately it was a much more difficult problem among the children of the poor.

Dr. C. S. BACON said in the management of puberty the first problem was to carry the child, particularly the girl, through this critical stage in such a manner that she shall go forth strong and sound; consequently there were three questions for consideration, nourishment, nutrition and exercise. If it was the object of the boy to become an editor, or the school girl to become an editress, it necessarily followed that her training should be to a great extent the same as that of the boy in order to meet him in competition. Our schools, as now constituted, were, he thought, conducted on the false principle that the training of both sexes should be to the same end. This had already led to fierce competition between the sexes and professions, which was ruinous to families, and would in time be more and more injurious to the female members of the race.

Dr. FRANCES DICKINSON mentioned cases to show that the ciliary muscle does its work the same when the child is in school as when it is out of school.

Dr. FRANK A. STAHL thought the school boy, by means of calisthenics, was fairly well developed physically. When, however, such a boy was put to work, in a short time the red cheeks and rotundity of form disappeared and the natural tendency to be active had given place to a certain amount of lassitude. Physical training and the development of the mental faculties should go hand in hand.

Dr. JOHN T. BINKLEY, JR., stated that his observations did not agree with those of Dr. Stevenson, in that he had found young women who were well educated, as school teachers, the least fit to undertake the work of nursing or any work which entailed much physical exertion. He recalled several instances among the school teachers who had undertaken nursing and abandoned it. He mentioned similar experiences in other walks of life. He places considerable importance on environment in the development of both sexes. The diet of children among the wealthy was carefully looked into and carefully prepared. The social demands upon wealthy parents were so great that in many instances the mothers could not take proper care of their daughters.

Dr. HENRY P. NEWMAN regretted that the obstetric and gynecologic aspects of the subject had not been elaborated more fully. The conditions seen by the gynecologist as a result of improper education or carelessness during the period of puberty were appalling. Attention should be called to them repeatedly, and when women and the public become better educated these conditions will be corrected. It was not intended to suppress education along this line, but to broaden it and thereby assist in eliminating those elements which will tend to greater preservation of the race.

Dr. HOLMES, in closing, said that one of the principal aims of his paper was to call attention to what could be done to make the school correspond with the requirements of the physical growth of the girl. He had nothing to say relative to the physical growth of the boy.

Dr. KROHN remarked that the object and aim of the American school were to develop the best type of manhood and womanhood and the best citizen, physically, mentally and morally.

French Congress of Internal Medicine.

Tuberculosis, mixed infections and organ therapeutics were the subjects of the day. Revilliod classified certain diseases as tuberculogenic: grippe, diphtheria, syphilis, puerperal fever and alcoholism. On the other hand, he stated that there are a number of diseases which absolutely veto the tuberculous infection; some are constitutional, such as arthritism in its multiple manifestations; others, while possibly favoring the tuberculous invasion, proceed to alter the soil until the infection spontaneously dies out. Evidences of this are seen in the stigmata of spontaneously healed tuberculosis found at one-fourth of all the necropsies. This latter class includes erysipelas, epilepsy, local tuberculosis, scarlet fever, typhoid fever (out of 1614 tuberculous patients in his service only 49 had typhoid antecedents, and most of these recovered from the tuberculosis), and diseases affecting the lung tissue; emphysema, sclerosis, putrid bronchitis, pulmonary gangrene, also pleurisy and pneumothorax, which, occurring even in advanced tuberculosis, may effect such a change in the lung tissue as to stamp out the tuberculous infection. "This antagonism between the lesions should lead to research to discover the antitoxin that exists from the beginning in certain organisms and develops spontaneously in others." Bosc urged the parasitic nature of cancer and that all ulcerated cancers should be considered contagious, suggesting that domestic animals and insects may convey the contagion, especially in damp, wooded districts. Vedel reported that he had succeeded in noculating a number of small animals with malignant tumors from man. Arloing has been applying sero-diagnosis to tuberculosis and found that the bacilli were agglutinated 94 times in 100 cases of pulmonary and 91 times in 100 of surgical tuberculosis; 34 in 100 cases of different affections and 22 times in 100 apparently healthy persons. Revilliod confirmed the great benefits derived from his siphon treatment of purulent pleurisy, which constantly aspirates the air, expands the lung by its negative pressure, renders resection of the ribs unnecessary and cures even so-called incurable pleurisies. Arloing stated that the diphtheria toxin and antitoxin both affect the respiration and circulation in the same way, increasing the number of respirations and pulsations and diminishing the arterial pressure. It follows that if the serum is introduced into an organism already strongly affected by the toxin, the effect is cumulative and hastens the fatal termination. Charrin reported that the urine decreases in amount under the influence of the toxin, while the serum increases the renal secretion. Pitres called attention to the fact that the displacement of the heart in pleural effusions is a providential process to protect it and keep it in a normal atmospheric pressure so that the valves can work properly. Hence the danger of bilateral effusions, in which this process is impossible. Gallard considers pyo- and hydro-pneumothorax in phthisis a *noli me tangere*. Courmont reported the case of a woman with Addison's disease transplanted with the suprarenal gland from a dog, causing hyperthermia, collapse and death in twenty-four hours. Two other similar cases have been reported, and they emphasize the danger of transferring to man the conclusions of successful experimentations on animals. The result may possibly depend upon the fact that the gland was derived from another species.

In regard to mixed infections, Widal asserted that each infection impresses its peculiarities upon the serum. He has obtained a whole series of agglutinative reactions in a single animal and found them reproduced in its young. "Mixed infections are probably of greater importance in diphtheria than in any other disease." Bacteriologic examination of vaccin lymph discloses a varied flora which tends to disappear as the lymph grows older. The preponderant rôle of mixed or secondary infections in case of influenza is familiar to all practitioners. He noted that the streptococcus passes most readily from mother to fetus, as it is carried by the lymphatic and sanguine circulation. The failure of antistreptococcus serum was ascribed to the number of varieties of streptococci and the fact that it is only effective against the identical variety from which it is derived. This renders it impossible to guarantee its effect for general use. Meyer announced that he has treated over three hundred cases of non-diphtheritic inflammation of the pharynx with gargles of sodium salicylate, 6 to 8 grams in 120 grams water, which he considers the best medication for the purpose; the pain, constriction, etc., are relieved at once. Chambard-Hénon reported three patients with biliary lithiasis, whose attacks ceased with the external application of methyl salicylate. Some experiments were related terminating with fatal meningo-myelitis caused by the action of the Roentgen rays on the spinal column. A village epidemic of typoid fever was traced to the dejecta of a typhoid patient thrown into the street and mixed with the dust. Eighteen of the thirty four cases were children who played in the street. Sweeping and sprinkling the street ended the epidemic. After reviewing the history of organ therapeutics, including the recent theory that the histones substances existing normally in the organism can be introduced to reinforce its means of defense against infection, and mentioning the increased power of resistance conferred on the dog and guinea pig by injections of extract of leeches, liver, dog's intestines and calf's thymus, Mossé reviewed the present status of thyroid medication, the most important application of organ therapeutics to date, observing that opinions are divided as to the nature of the toxic substances which accumulate in the organism after the suppression of the thyroid function, and also as to whether the extract acts as a stimulant of the nervous system or as a neutralizer of the toxic products engendered by fatigued muscles, etc. The effects of the secretion of the thyroid gland do not seem to be due to a single active principle, as two have already been discovered: Baumann's iodothyrin which has proved effective in treating trophic disturbances and the chronic toxemia of hypothyroidism, and Frankel's thyreo-antitoxin, which has not yet been applied to therapeutics, although experimentally it seems to neutralize acute toxic accidents (tetanus, convulsions).

It is apparently established now that the thyroid gland holds the iodin brought into the system in the food, preventing injury to the nerve-centers from this metalloid, while at the same time it elaborates the iodized peptone discovered by Baumann. Mossé prefers ingestion of the fresh gland and asserts that the results of this direct opotherapy are excellent in the spontaneous myxedema of adults and congenital infantile myxedema, also in endemic cretinism. Cystic, vascular and cancerous goiters are not affected by it, but the results have been very favorable in fleshy goiters, especially in young subjects and in an early stage. Improvement is rapid if obtained at all. Thyroid treatment is usually injurious in classic Basedow's disease, but is often very useful in "basedowified goiters." This treatment also seems to be indicated in dysthyroidism with or without goiter and perversion of the cerebral faculties. The results in trophic disturbances, infantilism, arrested growth, etc., justify further trials, but in rachitis they are contradictory. He also cited contradictory results in obesity and diabetes. Doses should be small and at long intervals; the condition of the liver and kidneys carefully noted, they may not be able to stand abrupt "demyxedemisation." A neuropathic temperament, arthritism, obesity, also indicate caution; the urine should be periodically examined and medication suspended at the first sign of intolerance. Improvement has been noted in some gynecic troubles, and he urged further trials and research in this line, which may prove important as a means of administering already animalized iodin. Cerenville attributes an important rôle to the chemic substances contained in the juices of the glands, iodin, phosphorus, iron, assuming that these natural combinations have more powerful physiologic properties than ordinary chemic compounds. Possibly the glands elaborate ferments which affect the metabolism of the cell through the blood. Gilbert and Carnot reviewed the technique of preparing organ extracts, giving the preference to an aqueous extract. The organ is mashed and macerated in water, filtered and partially concentrated in a vacuum or with gentle heat. Thus prepared the extract represents 6 to 7 per cent. of the fresh organ. Ovarian extracts, "effective in troubles due to surgical castration, and useful in the disturbances consecutive to the menopause, do not seem to affect the troubles originating in genital affections." Extracts of the spleen, kidney, lungs, brain and pancreas, are still on trial, but extract of liver has already taken a high rank and proven "rich in experimental and therapeutic results." It has been successfully used in diseased conditions of the liver and in other affections comprehended in the term "hepatism." Its marked antitoxic and coagulating properties also render beneficial against certain symptoms. But it has proved most effective in arthritic affections, especially gout and diabetes mellitus. The sugar eliminated fell from 155 to 85 grams in one case; from 81 to 11 in another. Hemoptysis has also been arrested by injections of liver extract. They concluded by classifying the organs: 1, those that only act as vital process, and 2, those that transmit their properties to an extract. The kidneys, pancreas, marrow, etc., may belong to the first class, which would explain their failure in opotherapy, while the liver belongs to the second class. The action of the organ extracts also differs in another important respect: some reproduce *in vitro* the glandular action, such are the gastric, pancreatic and hepatic extracts, which are mostly disastases; others, active *in vivo*, are inactive *in vitro;* liver extract, for instance, does not transform sugar *in vitro*, but does *in vivo*, probably by stimulating the glycogenic function of the hepatic cell. The success of ovarian extract in chlorosis (17 cases), was reported by Etienne, and the cure of severe hemophilia with thyroid treatment by Combemale. Others announced very favorable results from the administration of lung juice. "It has demonstrated its efficacy as a heroic remedy for the general intoxication consecutive to pleuropulmonary septicemia, although its use must be long continued." The improvement obtained in ordinary tuberculosis is slight and transient. Lemoine confirmed his previous announcements in regard to the value of methylene blue in arresting pain in neuralgia, sciatica, etc., and reported several cases of diabetes and gonorrhea cured with it.

The German Congress of Surgery.

Berlin, April 13.

The principal incidents of this Congress seems to be its repudiation of gloves and of Calot's forcible reduction treatment of Pott's disease. If the hands are washed several times during an operation and rubber gloves worn to protect them in septic cases, that is generally considered sufficient, and Mikulicz' "full dress costume" of mouth mask, cap and lisle-thread gloves is not generally endorsed, and the gloves even considered bacteria absorbers by some.

He concedes that efforts to secure absolute asepsis are like trying to square the circle, and others claim that asepsis is not necessarily the absence of germs, as witness the aseptic course of wounds in mouths swarming with bacteria. Perthes exhibited flexible gloves made of silk tricot and rubber, and Friedreich, seamless gloves of thin natural rubber. Both bear steam sterilizing a number of times. Mikulicz controls the sterilization of bandages, etc., by having a strip of paper with the printed word "sterilized" pasted in the box, and stained with an iodin-potassium iodid solution until the printing becomes invisible. When the steam permeates the box sufficiently to fully sterilize the contents, it dissolves the stain and the printed word appears again. Another device is a small tube of brenzcatechuin which is expelled at a certain temperature. He keeps his fingers sterile by painting the tips with tincture of iodin. Schloffer stated that the secretion of a wound is strongly bactericidal for five to six hours, even to artificially implanted pus cocci, but that this property is lost if the secretion accumulates and stagnates, when it favors the growth of bacteria. In regard to auto-absorption Noetzel stated that fifty anthrax bacilli inoculated subcutaneously killed the animals, while 1000 could be injected into a vein without fatal results. An important announcement was that pneumonia and bronchitis follow the use of local Schleich anesthesia in laparotomies as frequently as after general narcosis, although there is no vomiting (Gottstein, 233 applications). The Oberst method was endorsed, but the drawback of pain from the ligature of the member was noted and an easier method of arresting the circulation hoped for (*vide* JOURNAL, p. 496). Twenty cases of empyema successfully treated with the Schede thoracoplastic method were presented, but all were children. Perthes reported brilliant success with an ingenious aspirating contrivance resembling a Bunsen water-air pump which aspirates the pleural cavity and ensures the expansion of the lungs by its negative pressure. Three old and nine recent cases were completely healed in fifty-five days at farthest. Lenhartz also endorsed its efficacy from experience in one case. Karewski reported the case of a woman with empyema, tuberculous peripleuritis and a tuberculous focus in the lower lobe, completely cured by extensive resection of the thoracic wall, curettement and cauterization of the lung focus. He has performed eighteen extensive operations on the thorax including five with lung complications. No deformities resulted, even with children.

In regard to resection and extirpation of the stomach, Krönlein observed that Schlatter's patient was still doing well and had gained thirteen pounds since her stomach was removed. She eats and drinks the same as a normal person. He has had only two deaths in his last seventeen operations for cancer of the stomach, which he attributed to the use of ether and strict asepsis. Schuchardt exhibited a preparation from a patient of 58 years, whose stomach and duodenum had been almost completely removed on account of a large tumor. The remnant of each had grown, as evidenced by the increased production of hydrochloric acid, until a large blind sac had been formed, mostly of duodenum, and capable of holding 500 grams of liquids. Death was from pleuritis long after perfect recovery from operation. Czerny has found that many cases of cancer seem to retrogress like tuberculosis after a laparotomy. A number of patients with inoperable cancers (adherences), gastro-enterostomized, have lived to two and one-half years. This operation for non-malignant strictures produces fine results. His mortality has fallen from 45 to 16 per cent. in his total of 290 operations on the stomach. Mikulicz insisted on an earlier diagnosis of cancer of the stomach. Swelling of the supraclavicular glands is often the first symptom. It is necessary to extirpate all the avenues along which the cancer may spread and the glands toward the pancreas are the most difficult to locate, but it does no harm to open up the pancreas aseptically. The Billroth method can not be applied in extensive resections. Hahn mentioned that in his 141 gastro-enterostomies eight resections, all over 60 years of age had died, and he considers this age a counter indication for resection.

Bruns described the wounds inflicted by the "dum dum" bullets used by the English in India, already editorially condemned in the JOURNAL. He urged the Congress to call the attention of the authorities to this violation of the St. Petersburg convention. Kümmell presented some patients cured to date of lupus by means of the X-rays or concentrated light. Lewy Dorn protects the operator with the fluorescent screen against all the rays except those passing through the radiographed person, by enclosing the Roentgen tube in a lead box, with only one small opening for the passage of the rays. Walter also recommends placing the patient in a lead box, exposing only the part to be radiographed. This effect is

accomplished more easily with an adjustable board covered with lead. Most of the other communications presented have already been published and been reviewed in the JOURNAL. The Association has been presented with 50,000 marks, as a fund to send certain members to military campaigns in which Germany is not directly interested.

Chicago Academy of Medicine.

Regular Meeting, March 18, 1898.

(Concluded from page 1414.)

TUBERCULOSIS OF THE JOINTS.

Dr. JOHN RIDLON—More than one-half of all the work of the orthopedic surgeon does is in the treatment of tuberculosis of the joints. Tuberculosis may attack a joint either in the synovial membrane or in the bone. There is no evidence that it ever attacks a joint in the cartilage or in the ligaments. It is probably occasionally a primary infection. It is probably generally a secondary infection, secondary to tuberculosis in some of the glands, generally in the thoracic glands.

The positive symptoms of joint tuberculosis, when the disease is confined solely to the synovial membrane, and in those cases where traumatisim has not been a predisposing cause, are those of swelling, thickening of the synovial membrane and simply a mechanical restriction of the extremes of motion of the joint. In bone tuberculosis, that is, when the disease begins in the bone ends and before the synovial membrane is involved, there is no swelling of the joint except in cases of traumatism. The diagnosis must depend upon the restriction of motion in every direction to a greater or less degree. If in one direction motion is normally free, the diagnosis of tuberculosis must be seriously doubted, and probably excluded. This restriction of motion is from involuntary spasm in those muscles that normally control the motion of the joint. This condition is always present. The next symptom, which is practically always present, is atrophy of those muscles that control the motion of the joint in question. I have never seen but one case in which there was not this muscular atrophy. There may or may not be pain. If there is pain it is usually a distant rather than a local pain. There is usually some deformity, especially if the tuberculosis affects the joints or bones of the spine or of the lower extremities. The deformity is usually in the direction of flexion in the hip, associated with abduction or adduction, and flexion at the knee with outward rotation and abduction, plantar flexion at the foot, adduction at the shoulder, flexion at the elbow, flexion at the wrist and flexion in the smaller joints of the toes and fingers. In the spine, the first deformity is usually a lateral bend followed by a posterior bend or angle. Tenderness may be found in bone tuberculosis when the joints are superficial. Local tenderness is not found in spine tuberculosis, inasmuch as a tubercular focus is found in the vertebral bodies in practically every case. Disability comes on early and is very persistent. These practically make up the symptoms of joint tuberculosis.

The complications of joint tuberculosis are abscess, and in some joints dislocation, and in spine disease in a few cases paraplegia from pressure upon the spinal cord.

Cases of joint tuberculosis, if left without treatment, go on to a certain degree of deformity and disability and then the vast majority of them go on slowly toward a complete recovery of the disease. The tubercular focus may be evacuated by the formation of an abscess. It may become encapsulated or it may become absorbed by healthy granulation tissues. From 8 to 30 per cent. of the cases that are not treated die. A good many die from general tubercular infection; a good many of those that die have tubercular meningitis. A few of them die from waxy liver and kidneys, where there has been prolonged suppuration and the presumption of septic infection. Cases that are treated by orthopedic measures show a smaller percentage of deaths. Probably not more than from 8 to 15 per cent. of them die when so treated. The vast majority die from general tuberculosis or tubercular meningitis; and a few also die from waxy liver and kidneys.

The principles of treatment of all tubercular joint diseases are few and simple. The joint must be held as nearly immobilized as possible by mechanical means. The weight of the superincumbent parts must be removed in cases of spine, diseased joints of the lower extremities, and the dragging weight of the limb in shoulder-joint and elbow-joint disease oftentimes must be removed. This embodies the entire principle of orthopedic or mechanical treatment. As to what means shall be used to effect this immobilization and thus relieve the patients of pressure, the surgeon in charge must decide and resort to that method which is most fitted for the joint, which is best adapted to the patient, which will be best cared for by the family and which will cause the least criticism by the neighbors; for these cases must be treated for many years, and oftentimes you have to control the whole neighborhood as well as the individual joint.

The treatment of the complications will be as follows: As to the treatment of abscesses, there is a very decided difference of opinion between the orthopedic surgeon and the general surgeon. The majority of general surgeons believe that all tubercular abscesses in connection with joint tuberculosis should be opened at once and treated "surgically." The orthopedic surgeon believes that these tubercular abscesses should not be opened so long as they are simple tubercular abscesses, and should only be opened when they become septic; in other words, so long as the patient shows no septic symptoms the tubercular abscesses are left untouched unless they interfere by their position with the mechanical treatment of the joint. If the joint is thoroughly immobilized and protected from injury, possibly one-half of the tubercular abscesses will never proceed to spontaneous opening. They will become absorbed sooner or later and leave no evident result behind. They will give no unpleasant symptoms to the patient. The patient will never be aware of their existence from any illness, fever, loss of appetite, loss of weight or any ill feeling. When these abscesses approach the surface and become very thin the pressure becomes very great, from without, to open them, and most general practitioners will yield to that pressure and believe it is as well to prick an abscess wall if it is not more than one-sixteenth or thirty-second of an inch thick, instead of leaving it for a week or two or three weeks to break of its own accord. My experience has been that it makes a great difference which you do. If you leave them alone to break and to discharge of their own free will, without any pressure to evacuate the contents, the patient will rarely show septic symptoms, and by that I do not mean that I know the abscess cavity does not become septic. I simply know from clinical experience that the patient does not show septic symptoms, while in those that are freely incised, in the vast majority of cases, sooner or later the patient does show septic symptoms. When these abscesses cause septic symptoms before they have opened spontaneously they should be freely opened, they should be cleaned out and left open, and they should not be drained with a rubber drainage tube.

As to aspiration of tubercular abscesses, it is in my judgment a most absurd and ridiculous procedure. If the abscesses are aspirated early, while they are still in connection with tuberculous bone, they will surely refill. If an attempt is made to aspirate them after the bone lesion has healed it will be found to be impossible, because the contents will have become clotted and curdled so that they can not be completely evacuated.

With regard to the injection of various substances, of which iodoform has been the chief one for the past five or ten years, the orthopedic surgeons are thoroughly in accord that it is a useless procedure, that no case is benefited by these injections, and that very many are made worse by this method of treatment.

As to the treatment of complications or dislocations in conjunction with tubercular joint disease, there have been one or two cases reported, I believe, where a dislocation has been reduced and a cure has resulted without a redislocation. Usually this can not be done, and the effort is not worth the while.

As to the paraplegic complication in Pott's disease, practically all of these cases fully recover from the paraplegia if the patient is kept in the recumbent position sufficiently long. At present it is fashionable to attempt to relieve the paraplegia quickly by forcibly straightening the spine under an anesthetic, and a few brilliant results have been had from this method of treatment, but as yet it is so young that we can not say positively as to what the ultimate result is to be.

There is one point that occurred to me when Dr. Paddock was speaking, and which I wish to refer to outside of my remarks, namely, it is my personal experience that all cases of tubercular joint disease grow worse during pregnancy; that if they have had tubercular joint disease from which they have recovered, they are not necessarily made worse by a later pregnancy. At any rate, the risk is not greater from later pregnancy than from any other weakening condition.

Another point occurred to me during Dr. Babcock's remarks with reference to lung tuberculosis. Most parents are curious to know whether their child who is suffering from joint tuberculosis is likely to die from consumption. Unless it dies from general tubercular infection during the active course of the tubercular bone disease, my experience is that such children are not likely to die from consumption. Indeed, they are less likely to die from consumption than other people.

THE PEDIATRIC ASPECT OF TUBERCULOSIS.

Dr. ROSA ENGELMANN—Infants and children constitute a large horde of the victims, and run the gamut of almost every form of this malady. Of some manifestations they are almost the exclusive subjects. I need but mention scrofulosis or chronic glandular tuberculosis, coxitis, Pott's disease, primary intestinal tuberculosis, tubercular meningitis, and even solitary tubercle of the brain, spinal cord and spleen.

The excessive mortality in children from this disease is appalling. Before the antitoxin era, the diphtheria ratio headed the list; now a 35 and 48 per cent. tubercular mortality takes precedence. The gastro-intestinal death-rate of infants receives the attention of health boards, but compare its yearly 3 per cent. rate with the above mentioned proportion of deaths. Burdon Sanderson says, "That one-third of all the children that die in hospitals die from tuberculosis." Indeed, one-third of all deaths in early years are due to tuberculosis. Simonds states that 35 per cent., or over one-third of infantile mortality in the second year of life, is ascribable to tuberculosis. Hecker of Munich, in his statistics of 700 autopsies upon children, discovered 21 per cent. of latent tuberculosis, 1 per cent. of which was in babes under one year old. Henoch believed, and substantiated by postmortem findings, that many atrophic sucklings die from latent tuberculosis. This important fact is overlooked, since: 1. But few nurslings are hospital inmates. 2. Our statistics are derived from hospital records. Biedert states that "the death rate from tuberculosis during the first year is 6.8 per cent., and from the first to the fifth year, 48 per cent." Because of less poverty and better hygienic environment, America furnishes a lower rate. The report published by Holt from the New York Infant Asylum and Babies Hospital, shows only 8 and 14 per cent. death rates respectively, as compared with the 40 per cent. by Muller of Munich.

The localization of the lesions has in part been mentioned and will be dwelt upon *in extenso* by other Fellows of the Academy. Primary pulmonary involvement, in contradistinction to the adult type of disease, is rare in infancy and childhood. Primary glandular and intestinal implication, according to Simonds' statistics and Muller's postmortem statistics, comprise 92 to 84 per cent. of all cases. Their tabulations in regard to other organs are as follows, with Simonds' first and Miller's last:

Lungs	76.2 per cent.	Pia mater	26.8 per cent.
Probably secondary,	92 "	" "	26 6 "
Liver	24.7 "	Intestines	22.7 "
"	33 "	"	38 "
Spinal cord	20 6 "	Kidneys	15.6 "
" "	48.3 "	"	23.3 "
Pleura	10.3 "	Bones and joints	10.3 "
"	6.5 "	" " "	22 "
Brain	9 "	Peritoneum	7 2 "
"	8 "	"	18 "
Male genitals	2.1 "	Tonsils and omentum	1 "

Maas reports a case of tuberculosis of the tubes and ovaries in a five year old girl, with probable source of infection in the navel. Isambert records a case of pharyngeal tuberculosis in a four and a half year old child.

Kossel's observations in the Institute for Infectious Diseases in Berlin demonstrate that 40 per cent. of the one to ten year old patients applying for treatment for diphtheria are suffering from latent tuberculosis, and two-thirds of these cases exhibit enlarged bronchial and mesenteric glands.

Ruge of Berlin cites two cases of primary tubercular tonsillitis with secondary tubercular myelitis. He says: "It is most difficult to differentiate it from simple tonsillar hyperplasia."

Heredity is an etiologic factor only in so far as the transmission of lymphatic, immature, embryonic type of tissue predisposes to all kinds of infections, especially the tubercular. Scrofula seems better thus defined than by the term chronic glandular tuberculosis. Since it has been proven that there is a prenatal seminal, ovarian and intrauterine transmission of this disease, the question of inheritance therefore absolutely resolves itself into one of direct contagion. The germinative theory has been experimentally proven by such men as Landouzy, Martin, Konperoff, Pernise and Sirena; Birch-Hirshfeld and Schmorl were the first to prove its placental origin. Jahni confirmed the presence of tubercle bacilli in the semen of tubercular men, whose testicles were free from these germs. Theo bald Smith says: "The tubercle bacillus may pass in semen of the male and infect the ovum directly." Again, "the ovum may be infected by disease of surrounding structures in the female." J. Emmet Holt reports five cases of intra-uterine infection. Demme calls attention to a rare case of pulmonary tuberculosis in a twelve day old babe, doubtless of intra-uterine genesis. Berti reports a similar case at birth.

Post natal infection has been known to occur through the milk of a tuberculous nurse. Ritual circumcision is another established communicating agent. The ordinary infectious diseases of childhood add to the tubercular vulnerability. Infantile habits, such as creeping, placing articles in the mouth, are an added source of danger. Food, particularly milk, the staple dietary of infancy and childhood, here plays an important rôle. It is a well known fact that the lack of food and of dairy inspection laws, lax laws and improper enforcement of the same, account for the presence of from 30 to 50 to even 70 per cent. of tuberculosis in dairy stock and cattle. Lastly, household pets, such as dogs and cats, can communicate this dread disease to their little playmates.

To summarize: The points that I emphasize are: 1. Frequency in infancy and childhood. 2. Localization pertaining to this period of life; rare localization. 3. Etiology, pre-natal, post-natal.

CLIMATOLOGY IN THE TREATMENT OF PULMONARY CONSUMPTION.

Dr. WM. F. WAUGH.—In view of the extravagant claims put forward as to the value of climatic treatment in pulmonary consumption, it may be well to ask what can reasonably be expected from climate. It has not yet been shown that any atmosphere contains elements that are destructive to the tubercle bacillus, nor is any wanting in elements essential to the life of this micro-organism. Every variety of climate has been tried, from the equator to Iceland, the hot, the cold, the wet, the dry, the heavy damp air of the sea-level, and the thin cold atmosphere of elevated regions; even the germ-free depths of the Mammoth Cave have been exploited, but the result has been the same. Everywhere the tubercle bacillus has proved itself capable of existing and operating, of fulfilling its mission, to be fruitful and multiply and depopulate the earth.

The numerous claims made for various resorts as being free from tuberculosis, have even to be modified by the observation, singularly overlooked, that scarcity of consumption coincides with a scarcity of population. While tuberculosis becomes less frequent as we ascend from the sea-level, the population decreases as rapidly. Even in Western Kansas, at an elevation somewhat less than 5000 feet, agriculture has proved so unremunerative that many farms have been abandoned. But whenever any locality has acquired a reputation as a resort for consumptives, they have flocked to it in such numbers as to soon infect the soil and the air; so that now the first requisite may be said to be the fact that no other consumptives are present.

Admitting these premises, we must conclude that the only benefit to be obtained from climate is the improvement in the general health, the strengthening of the body in its struggle against the invading bacillus. And in the selection of a resort in each individual case we must apply the personal equation. Some persons thrive in the clear, cold, bracing atmosphere of Minnesota; others can not bear it, but do well in the warm, moist air of Florida. The thin, cool atmosphere of Denver brings health to some, death to others. Many find the most congenial conditions in the region stretching west from San Antonio; while if they were eligible and accessible, the Islands of Polynesia would be the ideal residences for many invalids.

In general that climate is best for the consumptive that permits him to spend the greatest proportion of his time in the open air, and affords the largest number of hours of sunshine.

But climate alone will not kill the tubercle bacillus, and the importance of this method of treatment has been vastly overrated with disastrous results, because it has led patients to rely upon climate exclusively, neglecting more important things such as the personal hygiene, rest during fever, avoidance of fatigue, the digestion, the local treatment of tubercular lesions and the specific treatment, which has now reached a development too important to be ignored. With these matters properly attended to, a consumptive will have a better opportunity for recovery here in Chicago than in any climate on the face of the earth where all other treatment is neglected.

SKIN AND GENITO-URINARY TUBERCULOSIS.

Dr. WM. L. BAUM—I do not care to go into the symptomatology and pathology of the various forms of tuberculosis of the skin and of the genito-urinary organs. Where the skin is concerned there must be a differentiation made in the kind of tubercular infection. There are many cases in which there is characteristic tubercular tissue present, but in which it is not always possible to demonstrate the presence of the tubercle bacillus. It has occurred to me that there might be an allied bacillus, one which is capable of producing the same tissue changes in the skin as the typic Koch tubercle bacillus. This is well shown in a case which was examined by Dr. Klebs some time ago, which occurred in my service in the Cook County Hospital. The patient, a negro, had the typic manifestations of tuberculosis of the skin of the lips. The glands of the neck were examined microscopically and were found so typic of the disease that the case was unhesitatingly pronounced tubercular,

yet no tubercle bacilli were found. This case forms one of a number I have treated with tuberculocidin injections (as prepared by Professor Klebs). The patient showed quite a decided improvement, but a cure has not been affected up to the present time, although he has been under treatment for a long time.

Lupus vulgaris, which is classified as a form of tuberculosis of the skin, is, strictly speaking, not always of typic tubercular formation, probably due to small number of bacilli and slow growth of the focus. There is a tubercular ulceration of the skin which is characteristic and presents a clinical picture that is characterized by a progressive ulceration of the skin, and which does not start with primary nodules as is invariably the case with lupus vulgaris. A case of this kind was under the care of Dr. Moyer some four years ago, who asked me to see the patient. The diseased process occurred on the patient's cheek and was accompanied by marked glandular involvement; for this reason an unfavorable prognosis was made. The large ulcerated surfaces were scraped out with a Volkmann spoon. Large numbers of tubercle bacilli were found. The fungoid granulations destroyed repeatedly with silver nitrate and the surface scraped repeatedly with the sharp spoon; the object of these successive scrapings was to prevent a heaping up of epidermal cells, and to produce a flat, non-adherent cicatrix. The patient's glands decreased considerably in size; she gained twenty-five pounds in weight and is living today. Cases of this kind lead us to conclude that the most virulent forms of tuberculosis of the skin are at times amenable to treatment. The other form of tuberculosis, lupus vulgaris, is too common to need any particular reference at this time.

In genito-urinary work there are frequently found tubercular deposits in the testicles; if they are recognized as such early in the disease, the removal of the offending testicle is probably the best method of treatment. A large number of cases of tubercular diseases of the bladder and sexual organs come to us at a period when they are beyond operative interference. Tuberculosis of the prostate gland, in which the prostate has already been partially destroyed and in which are found frequent hemorrhages, and where the actual presence of tubercular disease by a bacteriologic examination can be demonstrated, reaches the physician at a period when no operative procedure will give even temporary relief, because at that period there is not only a tuberculosis of the prostate and bladder, but extensive tubercular infiltration of the glands. Two such cases have come under my observation in the last two years. One of them was sent to me by Dr. Nelson of Morris, Ill., in May, 1897. The case was very interesting. It occurred in a Norwegian. The Norwegians, many of whom have settled in this country with their families, seem, when infected with tuberculosis, to have the disease in a virulent form. Those who have had experience with these cases say that they are usually hopeless when once infected with tubercle bacillus. This patient was 34 years of age and came to Dr. Nelson for treatment in 1896, at which time he was suffering from epididymitis, and owing to the great swelling of the epididymis the physician made a diagnosis of gonorrheal epididymitis; the patient strenuously denied any infection. A number of months later the patient had a slight sero-sanguine discharge from the urethra, followed by hematuria. About this time, in May, 1897, he was sent to the Post-Graduate Hospital for treatment. Examination revealed the fact that the patient had a nodular growth present in both testicles, and that upon the introduction of an instrument into the posterior urethra he had considerable hemorrhage. He gave a history now of not only having hemorrhages at the end of micturition but hematuria from the kidneys proper with marked pain in the back. He had an average temperature of 99.8 degrees during the first three days after admission. There was no stricture of the urethra and no history of venereal disease. The man is married and has two children. The patient was examined by Dr. Klebs and myself. His lungs were found apparently in excellent condition. An examination of the urine showed a large number of tubercle bacilli with spores, showing a breaking down of tubercular masses. He was immediately put upon tuberculocidin (Klebs). After the first injection the temperature rose to 103.5 degrees. This temperature lasted only about thirty-six hours, when it gradually declined until it reached 99 degrees. He was given a second injection on the third day, when the temperature rose to 102.8 degrees. These injections were made into the tubercular mass in the testicles, first on one side then upon the other. At the end of the tenth day we noticed a slight fluctuation in the right testicle. This fluctuating point was opened and a considerable quantity of cheesy material removed. This material contained large quantities of tubercle bacilli. The patient did not react after the tenth injection. The injections were continued for a period of four weeks and the patient sent to his home in the country. He worked during the harvest period last year. He has gained in weight and is in good condition. Frequency of micturition, which was a prominent symptom, has been reduced to seven or eight times a day and he does not need to get up at night to urinate.

The second case was an American, 29 years of age, who was admitted to the hospital July 19, 1897, with a temperature of 100 degrees. The lungs were apparently sound. Tubercle bacilli were found to be present in the urine of this patient as demonstrated by Professor Klebs. After the first injection the temperature rose to 102.3 degrees. Subsequently the man had about the same clinical history as the other patient, with the exception that he had marked pain in the apex of the right lung and expectorated considerably after the first injection. The patient apparently recovered, that is, he did not react to injections of tuberculocidin.

In reporting these cases I simply wish to point out that in non-operative cases we have apparently some means of treatment whereby we can hope for some amelioration of the symptoms in tuberculosis in the genito-urinary tract. I would not be justified in saying that these patients are cured, but they are certainly benefited and the results are rather encouraging.

I have here a report of a case in the *Progrès Médicale* of Dec. 11, 1897, by Dauriac, who has used the T. R. tuberculin of Koch, which I will briefly cite. The patient, an accountant by occupation, aged 32 years; brother died of pulmonary tuberculosis; patient had typhoid fever two years ago and has been ailing some since; has been a hard drinker, has had a cough for over a year, the expectoration being yellowish; has twice had hemoptysis; right lung affected. In May, 1897, he had an attack of hematuria which was not abundant, but consisting principally of mucus and small clots. These persisted for a number of days and reappeared from time to time during the treatment. Since May patient micturates very frequently, every twenty to twenty-five minutes. There are no renal pains but a continuous heaviness of the back. At the level of the bladder there is a considerable sense of uneasiness. Appetite is poor; evening rise of temperature, night sweats. Patient very emaciated and had diarrhea. No tubercle bacilli found in urine. In September he was given the first injection of T. R. tuberculin of Koch serum. The injections were continued until November. Urine shows a decrease of the deposits. Patient only urinates four or five times in twenty-four hours, and passes several nights in succession without any desire to urinate. Urine still shows slight trace of albumin. On November 2 the urine was perfectly clear. No more deposits; no more blood. Pains had disappeared. Auscultation shows the condition of the lungs considerably modified, only a slight difference in respiration. Patient eats heartily, but partakes mostly of milk. The milk treatment had previously brought about no amelioration in his condition. December 1 reports a complete cure.

I should not be justified in my cases in reaching this conclusion as the time is entirely too short to make any definite prognostications as regards the future.

SELECTIONS.

Idiopathic Dilatation of Colon; Operation; Recovery.—Mr. Frederick Treves, the eminent surgeon to the London Hospital, has recently performed a notable operation in the removal of the whole of the larger bowel below the transverse colon together with the anus, for the relief of that perilous condition known by the term in the caption of this article. The patient was a girl over five years of age, who had been the subject of painful symptoms, almost from birth referable to intestinal distention, and for the relief of this a first operation had been done in January, 1897, for the establishment of an artificial anus, which was measurably successful for a time. Nine months passed by and the difficulty of maintaining the artificial outlet was present, as is always the case with such openings when made as the present one was made. This necessitated the introduction for so many hours each day of a bent rubber tube which kept the orifice quite patent, but which occasioned the child a good deal of distress. In October, 1897, Mr. Treves resolved to attempt the excision of the colon from the splenic flexure to the anus, as this appeared to afford the only possible prospect of giving complete relief to what was still a distress-

ing condition. This second operation was performed on October 29. By means of an elliptic incision in the skin he isolated and removed the artificial anus, entering the abdomen on each side of the opening. The orifice in the colon was closed by a series of substantial sutures. The gut, which had at one time been so enormously distended, was now of more moderate dimensions, and its point of juncture with the narrow tube which represented the lower part of the colon was still abrupt. The narrow tube had shortened somewhat as the result of removing the distension. The dilatation of the colon extended up to the splenic flexure. Beyond that point the colon was practically normal, although it had evidently been to some degree distended and still showed some hypertrophy of its walls. The colon on the right side was normal and the whole of the greater bowel had a very free mesocolon. Having found that he could bring the left extremity of the transverse colon to the anus, he isolated and ligatured the left colic artery, and having clamped the bowel divided it at the splenic flexure. He then isolated the sigmoid artery and the superior hemorrhoidal vessels and ligatured them. He then excised the gut representing the descending colon, the sigmoid flexure and the upper part of the rectum. He divided the bowel low down in the pelvis below the entrance of the superior hemorrhoidal artery. The child was now placed in the lithotomy position, and having made an elliptic incision around the evidently narrowed anus he proceeded to remove the anus together with the lower and remaining portion of the rectum. The lower end of the rectum having been removed, the transverse colon was brought down into position and secured by a series of close sutures. The gut was conducted into position by four pressure forceps which were passed into the abdomen through the hole in the perineum. The operation was concluded by closing the wound in abdomen without drainage. The child made a speedy and excellent recovery. No sedative of any kind was needed, as little pain was complained of. The only complication was represented by some suppuration between the new rectum and the vagina. This was no doubt due to accidental infection of the tissues while drawing the transverse colon into place. As soon as the child began to run about again this discharge ceased entirely. It is probably safe to conclude that the patient will in due course obtain control over the new anus. Be that as it may, it was clear that the condition previous to the second operation was not consistent with other than a very short life. Mr. Treves has presented the specimen to the Royal College of Surgeons; he describes it as follows: It is quite clear that in this particular instance the dilatation of the colon was due to a congenital narrowing of the lower extremity of the bowel as represented by the segment supplied by the inferior mesenteric artery. This narrowed part exhibited no structural change. Little idea of the immense degree of dilatation of the colon can be gathered from the preparation as it now appears. The junction of the narrowed portion with the dilated part is not so abrupt as it appeared to be before the intestine was removed. At this point of junction there is no mechanical obstruction and no disease of either mucous or muscular coats. In mounting the preparation the structures which formed the anus have been removed. The *Lancet* offers a brief comment on the case, saying "the patient's condition was one where a tremendous operation was the only resource left to the surgeon, for the issue of cases of so-called idiopathic dilatation of the colon is as certainly fatal as the issue of cases of carcinoma of the intestines. That the little patient would have died without prompt surgical interference no one can doubt who reads the notes of the deplorable condition into which she had drifted. The attacks of obstruction of the bowel were growing more frequent and prolonged, the abdominal distension was extreme, no aperients could be used and enemata had lost their effect." All surgeons will be interested in reading the account of the operation as recorded in that journal, the whole story forming a perfect illustration of the remarkable possibilities and resources of abdominal surgery.

Epileptic Colonies Abroad.—Before the Harveian Society of London, Dr. A. Turner read a paper on the treatment of epilepsy in epileptic colonies, refering especially to the English colony established at Chalfont St. Peter. This charity had been founded for the purpose of giving employment to those epileptics, both male and female, who, by reason of their disease, were unable to obtain work or who were discharged from remunerative posts on account of epilepsy. The experience of the colony during the four years of its existence pointed to the fact that the younger the epileptic and the sooner he is admitted after the onset of the seizures the more satisfactory is the result of the general management and régime adopted. The principles which direct the management are simple: 1, removal of the epileptic from the town to the country; 2, regular employment under direction; 3, the maintenance of a well-ordered and regular mode of life, with avoidance of excitement and abstinence from alcoholic liquors; and 4, abundance of good nourishment of a simple nature. The general result is that the fits in the majority of cases diminish both in number and severity, in some cases to quite an extraordinary extent; the physical health materially improves, while the mental condition in all but a few cases shows obvious improvement. Some were sent in as suffering from Jacksonian epilepsy and as being in urgent need of operation; but the fits would cease or subside in frequency and severity so long as the patient remained in the hospital, although medicines were almost entirely withheld. He mentioned the difficulty of treating epilepsy occurring in those past middle life and instanced the case of a man who after being a great sportsman all his life had become epileptic. He would often be seized by a fit while out shooting and would lie down until the attack passed off and then resume his sport. He had taken the responsibility of allowing the patient to continue his favorite pursuits in spite of the obvious danger entailed, thinking that the danger to general health would be still greater were the patient to forego the mode of life to which he was accustomed.—*Lancet*, April 30.

PRACTICAL NOTES.

Varices of the Lower Limbs are successfully treated with Trendelenburg's resection of one or more segments of the saphena between ligatures, but this does not relieve the annoying hard chronic edema. Ledderhose accomplished this and completes the intervention by making from two to five incisions the length of the limb from the root of the foot to the knee, passing through the skin and subcutaneous cellular tissue to the muscular aponeurosis, suturing each incision as soon as made and applying a tight bandage. The limb is held vertically to prevent hemorrhage.—*Semaine Méd.*, May 11.

Application of the Forceps to the Superior Strait in Deformed Pelvis.—Budin reports sixty-four cases thus treated, with no deaths nor morbidity among the mothers; forty-five of the children left the hospital alive and well. Several of the children were already dead or deformed so that death was inevitable. He ascribes three other deaths to the antero-posterior application, which he denounces, advocating the direct application and changing this to the oblique without losing any of the advantage gained. One branch of the forceps is then over the mastoid region on one side and over the frontal on the other.—*French Obstet. Congress.*

Tuberculin in Tuberculosis of the Eyes.—Six years ago Zimmermann enucleated the left eye of a patient for ocular tuberculosis. A year ago the other eye became affected in the same way and while the tuberculous patches were cauterized tuberculin was administered, commencing with $\frac{1}{500}$ milligram and increasing in a month to 0.02 to 0.03 every second or third day. The patient is now practically cured, and a series of similar experiments on animals confirm the favorable results of tuberculin as a therapeutic agent in ocular tuberculosis in man and beast.—French Congress of Ophthalmology.

Intra-ocular Hemorrhage in Youth differs in nature and etiology from the same occurring in maturity or senility. Sudden, relapsing hemorrhage, evidently a form of epistaxis, is best combated by hygienic and tonic measures, quinquina, iron, combined with citric or sulphuric lemonade and ergotin. It is rapidly absorbed. Dyscrasic hemorrhage, frequently brought on by a fit of anger, is treated much the same way. Wet cups

to the temple will also be found useful. If the hemorrhage is secondary to chorio-retinitis, mercurial treatment is indicated, as this affection usually follows syphilitic infection. Apoplectiform hemorrhage into the retina is best combated with one-half to one gram quinin sulphate a day, supplemented by wet cupping the temples and myotics, preferably pilocarpin associated with eserin when the symptoms of glaucoma appear. The prognosis of this latter class is grave.—Abadie, at French Congress of Ophthalmology.

Indications for Petro-Mastoid Evidement for Dry Chronic Otitis of the Middle Ear.—Operate only when the tuning-fork or acoumeter placed on the skull can still be distinctly heard. Operate early before the lesions spread, and only one ear at a time, selecting the ear with the poorest hearing. The improvement often extends to the non-operated ear. The lower tones are seldom improved, the intervention affecting especially the higher tones and causing the gradual subsidence of the subjective noises. It should not be attempted on elderly people. It requires more or less complete integrity of the fenestræ, but every subject whose aerial audition of the higher tones is not too much diminished should profit by the intervention.—*Presse Méd.*, May 7.

By the Rectal Administration of Large Doses of Sodium Salicylate in Articular Affections, the desired effects are obtained promptly and thoroughly without affecting the appetite and digestion, according to Harlet in the *Nord Méd.* of May 15. He commences with 8 to 12 grams a day in two injections, each in a cup of bran water, adding a little opium or laudanum if necessary. It is completely absorbed in six to eight hours. He then decreases the amount by a gram every second day according to results. After seven grams, but one injection a day is given. He applies locally a 10 per cent. salicylic acid salve, to which a little turpentine or phenic acid has been added, and keeps the patient in bed ten to fifteen days after all pains and swelling have subsided, to prevent relapses or reinfections. This treatment puts an end to the pain in less than three days; the affection leaves no sequelæ, locally or at a distance, and cardiac or gastric complications are avoided. He has been equally successful with it in acute or chronic articular rheumatism or hydro-arthrosis, iritis, gonorrheal joint affections, cold pleurisy, etc.

Obstinate Cases of Herpes.—Dr. Oppenheimer (London *Lancet*, April 23), remarks that in his experience herpes genitalis, if not symptomatic of urethral discharge or stricture, is usually due to the decomposition of the smegma præputiale. Ointments mix with the latter and share in the decomposition to which the smegma is so liable, hence there is a contraindication against the use of fatty substances. In his opinion scrupulous cleanliness is the most effective preventive against the recurrence of this troublesome complaint. Hot alcoholic lotions, as eau de Cologne or brandy in water, are quite sufficient. But as the treatment is usually more steadily persevered in when a medicinal lotion is given he is in the habit of prescribing the following lotion: Boric acid 2 dr.; absolute alcohol, 1 oz.; and rosewater to 6 oz. This is to be diluted with equal parts of boiling water and is to be used as a lotion several times a day. A dusting powder containing dermatol and calomel assists the treatment. He usually prescribes the following dusting powder: Calomel, 20 gr.; dermatol, 30 gr.; bismuth subnitrate, 1 dr. This treatment has to be carried out regularly for from four to six weeks and then to be repeated about once or twice a week.

Sinusitis.—Haight's assertion that over one-third of the external diseases of the eyes are due to nasal affections (*vide* JOURNAL, page 1210) parallels de Lapersonne's address at the French Congress of Ophthalmology on the orbitary manifestations of sinusitis. He notes a frequent intermittence in the symptoms of frontal sinusitis, due probably to the temporary obstruction of the fronto-nasal canal; sometimes recurring neuralgia, with radiating pains in the region, redness of the conjunctiva, photophobia and profuse lachrymal secretion, all aggravated by efforts at accommodation and all subsiding in the course of a few hours to return the next morning at the same time. These cases are preceded by grippe or measles and accompanied by rhinitis. They recover, but recur and tend to chronic frontal sinusitis. In one case the pain, very violent, returned only during menstruation, with dilatation of the pupil and accommodation paresis. He described an acute case in which there were indications of a phlegmon of the orbit, and of meningitis, delirium, temperature 40 degrees C., but the maximum of pain on pressure was in the upper inner part of the orbit and the exophthalmia slightly infero-external, which indicated frontal sinusitis. Perforating the lower wall of the sinus released a purulent accumulation and resulted in a prompt cure with no recurrence. This operation, or trephining the anterior wall, will cure acute sinusitis, but a fistula is apt to persist in chronic cases. These require trephining with fronto-nasal catheterization and destruction of all the anterior and inferior wall of the sinus and of all the mucosa, by curettement or steam. He emphasized the importance of locating all the empyema which may have spread to an adjoining sinus, or be walled off by an abnormal bony partition, or in some abnormal supplementary recess in the palatine apophysis or elsewhere, such as Boulay has observed. Sphenoid or ethmoid lesions should be sought in every case of maxillary sinusitis. They explain a number of orbitary complications too often attributed to reflex action.—*Presse Méd.*, May 7.

Grey Oil in the Treatment of Syphilis.—Dr. Touren of the French navy has an interesting article in the *Archives de Médecine Navale* for April, 1898, on the treatment of syphilis by intramuscular injections. At the Moscow Congress Dr. Gaucher of Paris enunciated three propositions: 1. Mercurial injections in the treatment of syphilis should be the exception and not the rule. 2. When injections are employed the soluble salts of mercury are preferable to the insoluble; and 3, if an insoluble salt has to be used, the "grey oil" is the least objectionable. After five months' experience in charge of the Saint Mandrier venereal wards, Dr. Touren is in a position to disagree with the first two propositions, but with the third he is in accord. In civil life, he says, the administration of mercury by the mouth may be best, but in a military or a naval hospital this is certainly not the case. In the first place, there are not only some patients who keep their sores open or create fresh ones wilfully, but also others, more numerous still, who make away with their medicine. Secondly, it is universally acknowledged that in warm climates the digestive tract is peculiarly liable to derangement and should therefore be treated with circumspection. Intramuscular injections enable the physician to administer mercury safely, expeditiously and without any danger of digestive complications, while at the same time they ensure the ingestion of the drug as prescribed. There is therefore no valid objection to the universal employment of this method of treatment. In support of his second proposition Dr. Gaucher asserted that the administration of insoluble salts was a pharmacologic heresy: *corpora non agunt nisi soluta;* but Dr. Touren found that although the symptoms quickly disappeared when a solution of mercury perchlorid was injected, they invariably returned with equal rapidity. In his opinion, a clinical heresy was a far worse evil than a pharmacologic heresy, so he preferred to adhere to the drug which gave him the best results. In Dr. Touren's hands the "grey oil" answered all requirements. The injection was painless, the patient could walk about immediately afterward, salivation rarely showed itself and quickly yielded to an application or two of iodin, diarrhea only occurred once and, lastly, the mercury was absorbed with regularity and very slowly, the latter fact possibly accounting for the permanency of the cure. The formula adopted was as follows: Purified mercury, 20 grams; lanolin, 5 grams; and vaselin, 35 grams. The third of a Pravaz syringeful was injected at intervals of fifteen or twenty days, and as a rule three or four injections sufficed to ensure the disappearance of all transmissible symptoms.—*Lancet*, April 30.

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SATURDAY, JUNE 18, 1898.

TRICHINOSIS, WITH ESPECIAL REFERENCE TO THE INCREASE AND ORIGIN OF THE EOSINOPHILIC CELLS.

In the *Journal of Experimental Medicine* for May, 1898, THOMAS R. BROWN describes two cases, presenting the typic picture of trichinosis, observed in the medical clinic of the Johns Hopkins Hospital of Baltimore. The blood and muscles were subjected to minute examination according to modern methods, and certain facts of great interest have been brought to light. The red blood-corpuscles, counted at frequent intervals during the course of the disease in the first case, gradually increased from 4,200,000 per cubic millimeter at the time of admission to 4,900,000 on the day of discharge, nine weeks later. At the time of entrance the original percentage of eosinophiles was 37, gradually falling to between 10 and 15 per cent. Three weeks later the percentage began to rise and this rise continued steadily for one month, when it reached the remarkably high percentage of 68.2 per cent., so that more than two-thirds of all the white blood-cells were eosinophiles. During this time there was an absolute increase in leucocytes. During the whole period of observation the morphologic character of the eosinophiles was apparently normal. The detailed statement concerning the observations made on the blood with respect to the total number and percentage of the various kinds of leucocytes is clearly displayed in tables, which give the exact figures.

The three most striking points furnished by the study of the blood are: The marked increase in the number of eosinophiles, being 35 per cent. more than has ever before been reported; the coincident fall in the number of neutrophiles, and the marked leucocystosis. If further observations show this change in the blood to be characteristic, a symptom of the greatest value in diagnosis has been brought to light; a symptom which may perhaps help to clear up some of those cases which are regarded as rheumatic during life, the true diagnosis being revealed, perchance, in the findings of the postmortem table years later.

Pieces of muscle were removed from the right biceps on two separate occasions, and the microscopic changes are carefully described. The changes observed in this case, as well as in tissue obtained from a New York butcher, who died six weeks after the onset of the disease, consisted in marked proliferation of the nuclei, with the formation of muscle cells as well as of distinct vacuoles about the muscle nuclei and a granular degeneration of many of the muscle fibers, and, finally, the interesting and heretofore unnoticed condition, namely, the presence of a large number of eosinophilic cells.

This accumulation of eosinophilic cells in the muscles in trichinosis, coupled with the coincident marked increase in the circulating blood, suggests one way at least in which these cells may arise in the body. There are many views concerning the origin of the eosinophilic cells; all are hypothetic and some are rather far fetched. In Dr. BROWN'S study the constant inverse relationship between eosinophiles and neutrophiles, the increase in the former being associated with the decrease in the latter, as well as the similarity in the size and shape of the nuclei of the two varieties, all seem to point toward some intimate relation between the two forms. There is much to suggest that the transformation of neutrophiles into eosinophiles may have occurred in the muscles; thus transitional forms between the two were found in the first piece of muscle examined, and in the second piece, examined two weeks later, there was a greatly increased number of eosinophiles.

The process of transformation of one cell into the other can only be conjectured. The trichinæ, on reaching the muscle, cause various tissue changes and produce primarily or secondarily chemotactic substances that lead to a marked local leucocytosis. Polymorphonuclear neutrophiles emigrate and take up into their interior degenerated bits of muscle, and in these phagocytes a change in the character of the protoplasmic granules apparently occurs. Some material may be ingested, material originating from the disintegrating muscle fibers, which brings about a change in the chemistry of the cell, whereby eosinophilic granules are formed. Later these cells wander back again into the circulation and give rise to the marked increase of eosinophiles observed in the blood. This theory would not seem unreasonable, in view of the relatively large amount of muscle tissue in the body.

The study of the second case, which was not quite

so complete as the first, gave practically the same results.

These observations show that there may occur a marked increase in the percentage of eosinophilic cells in the blood in trichinosis; that this increase may be used as a diagnostic sign in this disease; and that systematic examination of the blood should therefore be undertaken in cases with indistinct intestinal, muscular, or articular symptoms, in the hope that perhaps some of the heretofore doubtful cases of this kind may be diagnosed.

THE RESECTION OF THE SYMPATHETIC.

The operative treatment of nervous disorders is an ever present surgical temptation that leads too often to the useless continuance of formidable experiments after the time that their proven insuccess ought reasonably to forbid them. Epilepsy is a condition that has especially incited surgical interference even in cases where the rational hope of cure or even of permanent alleviation is a minimal one. Trephining, excision of cortical centers, ligation of the vertebral arteries, castration, circumcision, the insertion of setons and various other operations have all had their advocates, and reports have been given out of their success, in very many cases, if not indeed in the vast majority, far too soon to be anything but misleading and actually dangerous as therapeutic guides. While the disorder is a sufficiently serious one to justify any operation, however grave, that can afford a reasonable hope of relief, it is certainly a waste of surgery and sometimes it may be also of human life, to indulge in formidable operations when an ample experience should teach us that any lasting beneficial efforts are only very remotely possible if in fact they are possible at all, and such temporary alleviation as may occur is equally likely to be the consequence of very much slighter interventions. The operative treatment of epilepsy, except possibly in comparatively recent traumatic cases, has been generally one of the brilliant failures of surgery.

The latest surgical procedure offered as a cure for epilepsy is resection of the cervical sympathetic, and it is recommended not for this disorder alone but for a number of others, Graves' disease, simple goiter, hysteria, chorea, paretic dementia, brain tumor, cretinism, idiocy and glaucoma. The theory of the utility of the operation is that by excision of the superior cervical ganglia—the cellular relays of the encephalic vasomotors—such a modification of the cerebral circulation will be produced as to affect the cause and course of these diseases. Any more exact pathologic basis for this procedure seems to be wanting and it does not appear at first sight how it is to be beneficial in so wide a range of morbid conditions, in fact, its usage in some of them rather resembles a rash experimentation grounded on no rational considerations. The cervical ganglion is often necessarily sacrificed in surgery of the neck without any evil results and the operation may therefore be considered as comparatively safe and harmless. If, on the other hand, it was serious, one necessarily involving risk of life, it would be absolutely inexcusable to perform it in some of these conditions without a better reason than the remote possibility of influencing the disorder through a general derangement of the cerebral vasomotors.

The reported successes, even by so strong an advocate as JONNESCO, are not such as to be convincing: a year and half, which is the longest time apparently of observation, is not conclusive as to cure in epilepsy and only the closest observation can absolutely exclude all possible manifestations of the disease. Many reported cases of relieved epilepsy still have nocturnal or abortive attacks, that may be and are easily overlooked and not infrequently what is considered a cure by a careless observer is in reality only a temporary change of type. The beneficial effects in Graves' disease may be real, but, so far, actual and complete cures of the condition do not appear to be generally reported. The fact that the vasomotor disturbances produced by the operation are not lasting, while it makes it less formidable, has also a bearing on its therapeutic value; it is hardly to be expected that a thoroughly chronic morbid habit, so to speak, of the nerve centers is to be completely broken up by a transitory derangement of the circulation.

There may be some question also as to the absolute harmlessness of the operation in all cases, and whether the production of a vasomotor paralysis of the head is necessarily as innocent a proceeding as the advocates of the operation would appear to claim. Cerebral congestion is not ordinarily considered innocuous, and it may not prove so in all cases when it is artificially induced. Injuries of the cervical sympathetic have in times past been credited with producing serious disorders such as insanity, and the inconvenient possibilities of operative interference with its functions ought not to be left entirely out of consideration. Advocates of newly introduced operations are strongly tempted to overlook their failures and to allow their prepossessions to color their judgments; it is therefore well in such cases to accept their results *cum grano*. When, as with this operation we have, with the claims of JONNESCO, CHIPAULT and its other advocates, the contradictory results of DONATH, PÉAN, and others, doubts of its value are certainly justified. In any case our knowledge of the pathologic physiology of the nervous system in this particular direction is too limited as yet to make the operation more than an experiment in the various diseases in which it is recommended, and one the success of which has not yet been satisfactorily demonstrated. As regards epilepsy, idiocy and other chronic and degenerative conditions its insuccess may be *a priori* expected from

our experience with other surgical interventions in these diseases, in spite of the premature claims of its upholders.

CONCERNING THE ABSORPTION OF FOREIGN BODIES THROUGH THE TONSILS, AND ITS RELATION TO THE DEVELOPMENT OF INFECTIOUS PROCESSES.

B. FRAENKEL[1] three or four years ago called attention to the frequency with which acute tonsillitis follows trauma or inflammation of the nasal mucous membrane. Inasmuch as a direct infection of the tonsil through its epithelium is to be regarded as rather difficult, because it has to take place against the exuding stream of lymph and leucocytes, he concluded that the inflammation followed an infection of the nasal mucous membrane, which reached the tonsil by way of the lymphatics. Histologically he was able to show the presence of bacteria in the crypts as well as in the tissues of the tonsil.

Further study of this theory necessitates in the first place the solution of the problem whether the tonsil is able to take up into its interior foreign bodies that come in contact with its lining membrane. The tonsil is generally credited with having a resorptive power, in the text-books, but experimental proof of this power seems to be lacking. In fact HODENPYL concluded from his experiments that the tonsils of lower animals did not absorb bodies through the intact mucous membrane. In order to throw some light upon this question, GOODALE[2] of Boston undertook certain experiments, to be detailed below. He regarded it from the start as more likely that if any resorption took place at all it would be more apt to occur from the loose lining that covers the crypts, rather than through the compact covering of the surface of the tonsil. GOODALE placed foreign bodies in the crypts of human tonsils, which were more or less hyperplastic, and which it was therefore necessary to remove. When the bodies had remained a certain length of time in the crypts the tonsils were excised and examined microscopically. After a few experiments it was found that a watery solution of carmine served the purpose of the experiments best, because the minute fragments could be recognized in the sections stained with the ordinary nuclear stains, as for instance hematoxylin. Carmine suspended in water was placed in the crypts by means of a blunt silver cannula fastened to a hypodermic needle.

When the tonsils were exercised immediately after the introduction of the carmine into the lacunæ there were no particles to be found in the lining membrane, though the little cavities were filled with the carmine water. After allowing the carmine to remain for twenty minutes in the crypts, fine lines of minute granules were observed running between the cells of the mucous membrane, in some places extending through a few layers of cells. Particles of carmine were also present in the interior of polynuclear leucocytes. After from forty-five minutes to two hours the carmine was found to have reached from ten to twelve layers of cells below the mucous membrane. Allowing two days for the carmine to be absorbed from the lacunæ the granules were found in linear arrangement between the follicles, lying mostly in leucocytes. There were leucocytes also in the crypts containing granules. In many of these leucocytes the nuclei seemed to be undergoing disintegration. After from five to ten days the carmine was found to have spread more diffusely through the tissues of the tonsils, lying especially in the interfollicular lymph spaces, but also present to a certain extent in the interior of the follicles. In sections of these tonsils, stained to show the presence of bacteria, no micro-organisms were found.

From these experiments GOODALE believes that the following conclusions are warranted:

Absorption occurs normally through the mucous membrane of the crypts of the tonsils.

The absorbed materials pass in through the follicular lymph spaces in the direction of the larger connective tissue septa.

During the absorption the foreign bodies are subjected to the phagocytic action of the polynuclear leucocytes.

Bacteria normally present in the lacunæ are not as a rule found in the tonsillar tissue.

Bacteria that may enter the tonsillar tissue would seem to be destroyed very soon after entrance.

It would also appear that acute lacunar tonsillitis is most frequently caused by the absorption of irritating toxins through the mucous membrane of the crypts, in which the bacteria grow as if in a test-tube.

[1] Quoted by Goodale, Archiv f. Laryngologie, 7 Band.
[2] Loc. cit.

THE BLOOD IN INFANCY.

One of the last lessons that a physician has to learn is that a child is not a little man. At birth the child is a very incomplete human; it increases in size rapidly during the first few months of extra-uterine life, but this rapid growth of its organs is of course at the expense of the stability, in other words, the resisting power of the organism to abnormalities of all kinds. The blood of infants and young children is especially prone to undergo changes from slight causes and, as a rule, the younger the individual the less the effort needed to throw the blood off its balance, so to speak. For instance, lesions causing a slight leucocytosis or an anemia in an adult would be very likely to bring about a marked leucocytosis or an anemia of high grade in a child.

The blood of a young child differs greatly from that of an adult; indeed, if we were to take the blood of a young healthy adult male as normal, we would be apt

to look upon the blood of a young infant as pathologic. If a specimen of adult blood were similar to that of a young infant we would be justified in concluding that that adult was suffering from some pathologic lesion that was exerting its chief malignant influence upon some of the blood-forming organs. But when we find in all infants these same differences from the adult type, it would be absurd to call infant blood pathologic, especially as it needs but the tincture of time to bring about gradually the condition we are in the habit of regarding as the true standard.

Normal adult blood consists of fluid and solid elements, the latter of which are only of interest to us at present and are known as red and white corpuscles, existing in the relation of one white to five to six hundred red. One cubic millimeter of blood contains approximately five million reds (4,500,000 in the female), and from 5000 to 7500 whites. The red are all of about the same size and shape and are normally not nucleated. The white are divided into several varieties, the division depending upon the age of the cell, young, adult and old leucocytes. The proportion of these one to another is a point of considerable practical importance; the young cells are of two varieties, the small lymphocytes comprising 20 to 30 per cent. of the whole, and the large lymphocytes 5 to 10 per cent.; the adult forms, known as the polymorphonuclear neutrophiles, 60 to 70 per cent., and the old cells or eosinophiles, 0.5 to 4 per cent. Many other points might be stated as regards the corpuscles, but the above are sufficient for the purpose at hand.

To take up the changes in infantile blood in the same order we have enumerated the facts in the adult, we find first that the infant is very liable to have an excess of red corpuscles per cubic millimeter from one-half to as high as one and a half million. A very common change, so common in fact as to be almost constant, is the leucocytosis or increase in the number of whites that occurs during the few first days after birth. Cases have been reported of a leucocytosis of the first day of nearly 20,000, increased by the first meal to over 25,000, gradually receding toward the normal line during the next few days. Leucocytosis occurs after a meal in adults, but never to this great height, another point showing how easily the blood of infants is affected by slight causes. The red corpuscles usually show considerable variation in size and shape, a condition known as poikilocytosis, and not infrequently we find in the peripheral blood that variety of nucleated red corpuscle known as the normoblast, a cell only found in adult blood when pathologic conditions exist. The most important difference, however, is between the relative number of the varieties of leucocytes as shown by the differential count. This count shows that the lymphocytes are relatively more numerous in infants, being present even as high as 60 per cent. This increase is mainly at the expense of the adult forms, which may exist as low as 20 per cent. When we remember that the adult forms are the only ones of the leucocytes to exert phagocytic action, the readiness with which children become diseased is rendered more easy of explanation. The hemoglobin estimate is not of much importance from a practical standpoint. As the reds are more numerous during the first few days of life, the percentage of hemoglobin would, other things being equal, be somewhat increased. This percentage falls with the lowering of the number of reds and in a somewhat greater degree, so that the hemoglobin after the first week is lower than in the adult. From the comparison then of the blood of infants and adults, we can readily see how unstable that of the former is; how easily it may be acted upon by slight causes, causes that would have little or no effect in the adult. It might also be stated that pathologic lesions that exercise but a slight change in the blood of the latter, are likely to produce in infants swift and terrible changes that result in speedy dissolution, so that it may be taken almost as an axiom that the blood changes by which disease is known in the adult, are in childhood vastly exaggerated, and that the younger the child, the more readily these changes occur and the more pronounced.

CORRESPONDENCE.

Dr. C. Henri Leonard replies to Congressman Corliss, who evidently misrepresents a large number of his constituents.

DETROIT, MICH., June 10, 1898.

C. HENRI LEONARD, M.D., Leonard Block, Detroit, Mich.

Dear Sir:—I am in receipt of your letter with a copy of resolution, and I regret that the medical fraternity should act so *hastily* and without proper investigation.

In the first place, I never introduced a bill in Congress of any name or nature, touching the subject embraced in your resolution.

Secondly, the Hepburn bill, to which you probably refer, I reported to the House by order of the Committee of which I am a member, thereby performing the *duty* devolving upon me as such member.

Thirdly, this measure simply enables the Marine-Hospital service to do more efficiently the work now being done, and does not materially extend the scope of that department.

Fourthly, the measure which the medical fraternity are advocating has not been acted upon by the Committee for the reason that, if adopted, it would entail a *very large expense* upon the Government.

I should be glad to place the physicians right on this subject, and as you seem to be chairman of the committee that prepared the resolution and one of the men who acted without due knowledge, I trust you will *undo the evil* you have created by the publication of *facts not true.*

Very truly yours, JNO. B. CORLISS.

DETROIT, MICH., June 11, 1898.

Hon. JOHN B. CORLISS, House of Representatives, Washington, D. C.

My Dear Sir:—Yours of June 10th duly at hand. In reply to the same allow me to say that your "firstly" and "secondly" are but quibblings over terms. So far as the medical profession of the United States is concerned we do not care

whether you "introduce" a bill, or "report" it to the House; the effect on the profession, if the bill be passed, remains the same. If you have been unjustly "sacrificed" for doing your "duty," why that is nothing that concerns us as medical men. What we are concerned in is your "doings," whether that be in accordance with your so-called "duty," or in accordance with what your medico-political constituents may wish you to do for them. "Duty," then, as you term it, is to be pitted against the powers that help create you a member of the House. The "powers" will see to the "duty" later on, for I assert that the bill you "reported" out, in accordance with "duty" is a bill that is decidedly objectionable, in many particulars, to the medical "powers" that made you a Congressman.

Your "thirdly" is not in accordance, in its conclusions, with conclusions formed by the medical men that have thought over and contemplated the Hepburn bill in its ultimate results. It does not meet with the approval of the mass of the profession in its "enlarged" powers of the Marine-Hospital service. That "power" of the said service, so far as the *general* profession is concerned, is abundantly far-reaching now.

Your "fourthly" is self-condemnatory. The Committee refuse to report the Bill out that has received the endorsement of tens of thousands of medical men throughout the United States, received the endorsement of our medical press, that has received the endorsement of our National, State and County and District Medical Societies, forsooth, because of its "expense!" But the same Committee had no hesitancy about "reporting out" an inimical bill, because it was less expensive! This is a fine *reductio ad absurdum!* Who made the Committee to sit as judges over their creators in the matter of "expense?" Who is paying the expenses of that same Congressional Committee but the ones now asking for a bill to *suit them*, and asking for a bill not to pass that does not suit them, but which may suit a handful of marine doctors—and the Committee, because it is "cheap?"

No, Mr. Corliss, if you and your Committee wish to be set right with the medical profession of this country you will have to undo what you have done, as far as you can, in the expansive provisions of the Hepburn bill, and do not let "expense" be such a bogie-man in the future. I am really glad to learn that a Congressional Committee does sometimes stop at "expense," even if my profession suffers thereby; later on we medical men, when we come to cast our ballots, may think certain United States Congressmen are a little too "expensive" for *our* use, in the National House; then comes *our* time to sit in judgment on "expenses." And when the doctors of a Congressional district get all to work it often proves quite "expensive" to the candidate they disfavor. And right here allow me to say that the *country* members of the profession are more outspoken on this matter, so far as I have heard them, than have been some city members of the medical profession.

I am really inclined to think that party lines, so far as doctors will be concerned, will be forgotten in the desire of attaining the Congressional representation that we have been seeking for the past six years or so. It is possible that this may not prove a National issue on Congressmen, but I think it will soon do so, if we are continually sat down upon on the ground of "expense." We doctors supposed we were working for the good of the country, for the good of humanity in general, else we would not be so in earnest about it. We have been at work too long and too unitedly for us now to sit down and "fold our hands" just because a Committee judge our wants too "expensive," and try to force something along that is against our will, because less expensive.

I am talking thus frankly and plainly, not from personal motives, or likes or dislikes; but as a member of a Committee from our State Medical Society that has been at work upon this matter for some years, jointly with other State and National Medical Societies, and I know of the intense feeling of the profession in this matter. It takes a long time to get State recognition of medical matters, and longer to get National recognition; but the time is coming, and that right soon, when the National Congressman may be, as the State Congressman has in the past found himself on several occasions, completely "snowed under" when he has come up for political suffrages.

We medical men are deeply in earnest about this matter, as a common cause of humanity, as well as for our betterment in the handling of epidemic diseases, and in the enlarging our general knowledge of cause of epidemics and means to be adopted to secure their control.

Yours very respectfully, C. Henri Leonard, M.D.

Appendicitis.

Long Island City, June 7, 1898.

To the Editor:—I have read with interest Dr. J. F. Baldwin's paper on "Some Unusual Cases of Appendicitis," in the Journal of June 4, 1898, and particularly struck by his reference to the case of complicating general peritonitis (purulent) and his remarks thereon, and reference to Dr. Abbe's statement that the maximum limit of expectancy from an operative standpoint in these cases might be placed at two and one-half days. I have had a number of operative cases of such a character that would tend to substantiate this proposition as a certainty, yet have had several which would negative it, at least in individual cases.

Thinking that it might encourage others to persevere even in very desperate cases of this character, I beg to report the following case, which is the most positive and the facts of which are the clearest in my mind, the patient having been operated on by me on Feb. 22, 1898.

The man, a German about 40 years of age, went to work fairly well on Friday morning early, although he had suffered for several days previously with colic in right side, of which he had had a number of previous attacks, recovering each time after a few days. On the same Friday he was again taken with pain at his work and was brought home with difficulty. I saw him in consultation on the following Tuesday morning, four full days having elapsed. His abdomen was terribly distended and evidently full of pus. I operated at 3 P.M. on Tuesday, but when I placed him on the operating table I noticed the point of maximum swelling and induration was behind and over the lower ribs. I therefore determined to open mid-posteriorly and high up at this site, removing a section of one of the ribs for the purpose of better drainage. I removed about one gallon of pus. The abdominal swelling disappeared in keeping with the evacuation of the pus and I therefore made an incision over the appendix where I originally contemplated, and finding the peritoneum densely thickened and the pyogenic membrane beneath, I opened through and with caution passed a long drainage tube from the greater to the lesser peritoneal cavities, so that the wound could be gently flushed via its natural drainage channels. I made no attempt to find or remove the appendix, as in this class of cases I think it wiser to refrain from more than the most necessary means. The liver and the intestines, both large and small, came into view in the mid-posterior opening, but I protected them, although they were already the site of an active inflammation. The patient has made a good recovery, though somewhat slow owing to the immense drain on his system. The previous and present history of this man were unmistakingly that of suppurative peritonitis consequent on appendicitis, and in the other cases in which I have lost I am convinced too much importance was attached to the appendicitis, which was simply the causative factor in the production of the more grave and rapidly fatal septic condition of purulent diffuse peritonitis. By studying the planes of natural drainage of the pelvic and abdominal

cavities I am convinced that in these cases combined anterior and posterior drainage is the best, and if only one opening is made the posterior would be the better, as a man will not drain rapidly enough through an abdominal opening to remove such large quantities of pus as form in these cases, surprising even a surgeon himself and leading often to the supposition that they might be of longer standing. Some observers have recommended that the tract of the drainage tube in these cases be not washed out, but I think cautious washing after thirty-six or even twenty-four hours, with boracic acid, does good.

I would not trespass on your space save that such an excellent surgeon as Dr. Abbe should have failed to find cases that lived after two and one-half days, and that I am certain that if the essential cause for the operation (septic absorption from pus) is kept in mind, and the appendix kept subordinate in operative manipulations, we stand a far better chance of success. Very respectfully yours,

JOHN F. BURNS, M.D.

A False Statement.

SPRINGFIELD, ILL., June 6, 1898.

To the Editor:—A concern in Chicago claiming to teach the alleged science misnamed osteopathy, makes the following remarkable statement relative to its so-called courses, in circulars which are sent broadcast over the country:

"Terms of study are so graded and the courses of study so broad and complete that they comply with all the requirements of the Illinois State Medical Board and allow our students two years' credit on a regular medical education. These credits are recognized in any medical college in this country and will be equivalent to two years' work done there."

If by the "Illinois State Medical Board" is meant the Illinois State Board of Health, the assertion made in reference to that body is a lie in the fullest acceptation of the term. It is not true, furthermore, that the "credits" named are recognized in any medical college in this country. On the contrary, it is exceedingly doubtful if a single reputable medical institution will grant any advanced standing whatever to applicants from this and other "colleges" of similar character. Should, however, this be done, it is needless to say that the institution or institutions concerned will receive no further recognition from this Board, and it will be remarkably strange if the various State Boards of Medical Examiners throughout the Union will view such irregular proceedings with complacency.

As the circulars are calculated to deceive the unwary and to cause prospective graduates in medicine to waste two years of time, I will ask you to give this letter a prominent place in the JOURNAL, in order that the facts in the case may be widely disseminated.

J. A. EGAN, M.D.,
Secretary Illinois State Board of Health.

PUBLIC HEALTH.

New Jersey Procedure for Violation of Health Act.—The legislation involved in the recent case of State vs. the Board of Health of Woodbridge Township, so far as its sanction is concerned, the supreme court of New Jersey says is anomalous and defies construction; for it inextricably blends together a civil and a quasi criminal jurisdiction. It holds that a jury trial is not permitted by the health act of 1887 (2 General Statutes, page 1638, section 18). And it futher declares that to sustain a judgment under that act there must be a conviction in the form prescribed by the supplement of 1888 (2 General Statutes, page 1642, section 41), which expressly requires a conviction as a foundation for judgment, prescribes its terms and provides that it shall be signed by the magistrate.

Railroad Hygiene in Germany.—The new regulations of the Imperial Health Board and Department of Public Works suggest that all passenger cars, especially sleepers on lines running to resorts for consumptives, are to be finished with smooth walls and ceilings, with no projecting or carved ornamentation and no plush or similar substance on the walls. The cushions and seat backs must be removed from the car at certain intervals and subjected to steam disinfection; the floor space under the seats left free and easily cleaned. Waiting rooms and all roofed-over stations must have the floors washed as often as once a day where there is much traveling and the walls occasionally washed to the height of a man's head. There must be an abundance of cuspidors in cars and stations, as large as possible, and so constructed that they do not easily tip over nor spill their contents. The railroads are to follow these regulations as far as possible at present and conform to them exactly in renovating and constructing in future.—*Münch. med. Woch.*, May 17.

Vital Registration in Connecticut.—In the last *Monthly Bulletin* of the Connecticut State Board of Health, Dr. Lindsley utters a note of despair over the poor success of all his years of hard work to bring about an intelligent and trustworthy registration of the cause of death in his bailiwick. Note the following paragraph: "The heaviest death rate occurred in Thompson, being equivalent to 45 per 1,000 annually of living population. In several instances the cause of death was very indefinite. Among them are the following alleged causes: Debility, paralysis of heart (which is only another name for 'heart failure' and for which a burial permit should not have been given), pulmonary emfalius, pulmorun, whatever the last two may mean. Query: Is it ignorance, or what Artemus Ward called 'just pure cussedness,' that explains such certificates of the causes of death by medical practitioners. It is, of course, impossible to include the above in any classified order." It is indeed a thankless and well-nigh hopeless task, but Dr. Lindsley will need to go right on with his efforts to the end of the chapter. Taking up for a moment Dr. Lindsley's last, or 1896, annual report, which came to hand a few days ago, we find that the mortality of the State was 15,025 in the year 1896 and that in the case of twenty certificates of death the *causa mortis* was not specified by the physician or coroner. In addition to these there were 858 certificates whereon the cause was assigned to "tumors," "debility," and similar vague terms which, as the Secretary says, "were not creditable to the physicians who rendered the certificates."

Typhoid Fever Disseminated by Outdoor Games of Boys.—An English practitioner refers to the fact that many cases of typhoid fever occur in the autumn, and attributes the cause of the disease to games, such as marbles and peg-top, which are played in the street during this time of the year after the cricket season is over. In playing marbles a boy frequently licks his fingers to prevent the marble slipping, and the whip-cord of a top is wet in the mouth for the same reason. In this way germs are conveyed into the alimentary tract. The writer's theory is borne out by the fact that the disease almost exclusively affects boys; girls do not as a rule play at games of that kind. Some weeks ago he saw a boy with typhoid fever, was asked by his parents how he accounted for the attack, as there was no case in the same street, and so asked the mother to let him see the trousers worn by the boy, and showed her how stinking the pockets were; they contained marbles, etc., and dirt from the street. These games may therefore be a great source of danger to children living a town life. But how to remedy the evil is not very easy while such crude methods of doing town scavenging work is permitted to continue. In his own city of Sheffield, he says that he has seen the contents of yard-vaults shoveled out into the streets or roadway in large heaps to be carted away afterward, but leaving behind remainders lodged between the stones of the road, upon and near which the open-air games of boys are daily practiced. He had thought it advisable to point out this source of danger to the young, as he had not as yet

seen any mention of games in any paper or book. Contaminated water in his opinion is not the only source of typhoid and other filth fevers among boys.

Sanitation of Lodging Houses at Boston.—The Board of Health at that city has established an elaborate new set of rules that will probably exterminate a portion of her least desirable houses for lodgers. The air-space, or "sacred breath-cube," has not been fixed at an unreasonably high minimum, namely, at 300 cubic feet per lodger, but much depends on the concomitant measures for ventilating the dormitories. The new rules state that the means for light and ventilation must be satisfactory to the Board of Health and beyond the control of the lodgers. All floors and stairways must be sound, smooth, and either painted or shellacked. There shall be allowed not less than 300 cubic feet of space to each lodger in sleeping rooms. Open and spacious dormitories will be preferred; single or small rooms will be allowed only in exceptional cases, and then only with fire-proof partitions. No carpeting will be allowed on floors or stairways. There shall be not less than two horizontal feet between the sides of any two beds. All bedsteads must be single and of iron. Blankets will be required and "comforters" will be prohibited. No person will be allowed to sleep in his day-clothing. No person who is unclean will be allowed to retire without a bath. Water-closets, one to every twenty lodgers, lavatories and shower-bath, with hot and cold water, all with open plumbing, must be furnished on each floor, and the floors of the same shall be of marble, slate, or concrete. Smoking in sleeping rooms is prohibited. All stairways, fire-escapes, and other means of exit in case of fire must be in accordance with the statutes and ordinances on that subject and to the satisfaction of the building commissioner. Stoves for heating will be allowed only under the most favorable conditions for safety. The use of portable kerosene lamps is prohibited. A reliable person or persons must be in attendance at all hours of the night.

An Interesting Parliamentary Debate on Vaccination.—An animated discussion on a vaccination bill in the English Commons on April 19, brought out a speech by Sir William Priestley, an eminent London practitioner, who was formerly a professor in King's College medical school; it contained a sharp arraignment of the enemies of vaccination. Among other points he stated that it is computed that at present about a third of all the children born in England and Wales were escaping vaccination, *i. e.*, about 300,000 children, and in this connection they could not but recollect the serious object lesson recently presented by Gloucester. The discovery of glycerinated lymph was made in 1891, and yet it had never been adopted systematically in this country. It was most likely, if once adopted, to remove many of the objections and apprehensions of parents, which he had no doubt were very conscientious. It had been adopted in other countries where they had ministers of public health, and where a great deal more attention was paid to the question of public health than was the case in this country. The system had been carried out at Berlin, Paris, Geneva and other centers, and as yet there had been no misadventures. Admitting that harm was done by the practice of vaccination, it was not easy at any time to do a vast amount of good without some modicum of harm. All medical efforts were relative; if they were absolute no one would die. If they were to look into the history of many remedies they would find that misadventures came by their use. It was well known for instance, that no one could avail himself of the administration of chloroform to relieve pain without fear of misadventure. In regard to those domestic remedies, Epsom salts and castor oil, the effects had gone in some cases much farther than had been intended or expected. The great thing in the use of all remedies was to do the greatest amount of good with the least possible harm. It was entirely a question of proportion. Unfortunately, there were always people possessed of what he might be permitted to call the "anti" mind who, with a perverse ingenuity, fastened on the harm and refused to look on the other side of the question. A distinguished scientific friend of his once said he always tried to teach his pupils to think to scale as well as work to scale; but these people who were always dwelling on the harm did not think to scale. They concentrated all their attention upon the mischief and they came signally to grief in their reasoning. Sir William Priestley then went on to express approval of the proposed domiciliary vaccination, although at the same time he hoped that stations would not be abolished altogether. Medical officers under the proposed system would have better means of persuading parents to submit their children to vaccination and of showing that objections were really not valid. It had been said that vaccinators might be very unfavorably received, and in some instances be in danger of violence of antivaccinationists; but in Chicago, among a population made up of all sorts and conditions of men, a system of domiciliary visits had the best possible effect, few children remaining unvaccinated. Some years ago, he had been informed, it was the custom in France to pay a small sum to parents who brought their children to vaccination, and it was surprising to find how parental scruples about danger to children were removed by the few sous paid. It was desirable that some arrangement should be made whereby medical men who vaccinated their own poor patients should receive the fee otherwise paid to the public vaccinator. To the extension of the limit of age he saw no objection so far as danger to children was concerned, for experience had shown that infants under twelve months were unlikely to take smallpox. There were some objections, but they might be overcome. True, there was more risk that the vesicles might be rubbed and contaminated when the child crawled about, and in twelve months removals made the following up of the cases difficult. We might also imitate the practice in Germany, which obtained also in Chicago, and impose some check on the admission of unvaccinated children to school. Antivaccinationists made capital out of the fact that in outbreaks of smallpox many victims had been vaccinated, but they omitted to say how large a proportion had never been revaccinated. It might seem hard to impose an obligation on parents to which they objected and of which they did not see the value. But the object of the State should be the welfare and happiness of the greatest number and the good of the children, above all things, should be the regard of the State as well as of the parents. The danger of allowing a large number of children to remain unvaccinated had been very clearly seen at Gloucester and he would venture to point out that in proportion to the stringency with which vaccination was carried out so was protection furnished to the community. Medical men thought that vaccination was just as essential to the welfare of the child as the provision of food and raiment. If it kept the child from disease, and they believed it would, there ought to be no remission of penalties. At any rate, if there were remission of penalties there ought to be something which was almost equally efficacious. He should be disposed not to remit penalties, but if the parent had conscientious objections to vaccination he would not give it up altogether, but suspend it for a time, say until the school days. This would be a great deal more logical than remitting the penalties. He would make one other suggestion. All parents who insisted that their children should not be vaccinated and who persisted in this course even after being fined once or twice, should be compelled to subscribe to isolation hospitals. Isolation hospitals had been again and again proposed as an alternative to vaccination and no doubt they were the next best thing, though they would not take the place of vaccination.

BOOK NOTICES.

Medical Reports for the Half-Year Ended Sept. 30, 1896. Fifty-Second Issue. Paper. Pp. 44. Illustrated. Special Series No. 2. Published by order of the Inspector General of Customs, Shanghai, China, 1898. Price $1.00.

This volume contains report on the health of various leading cities of China, especially as to cholera, smallpox and typhus fever, sunstroke, dysentery, enteric fever, sanitary improvements, and cases with full-page plates of parasites; also temperature charts. The various contributors to these reports are:

C. C. de Burgh, E. W. von Tenzelmann, James H. McCartney, Jno. D. Thompson, E. H. Hart, Alfred Hogg, J. J. Delay.

Sixteenth Report of the Garfield Memorial Hospital.—Paper. Pp. 64. Illustrated. Washington, D. C.: Gibson Bros., 1898.

This report covers the year 1897, contains the report of Board of Directors, Board of Lady Managers, Finance Committee, Medical Staff, and various tabulations and tables of operations performed in the hospital during the year, with classification as to nativity and occupation of patients. There is also a report of the dispensary service and training school for nurses. Numerous full-page plates of the hospital building, wards, etc., are an addition to the volume.

Report of Births, Marriages and Deaths in the Province of Ontario for the year ending Dec. 31, 1896. Cloth. Pp. 212, Toronto: Warwick Bros. & Rutter, 1898.

This report contains numerous tabulations relating to the registrations of births, marriages and deaths throughout the above Province, printed by order of the Legislative Assembly of Ontario. Data relating to other matters of public health are included, and the deaths from diphtheria, tuberculosis and other contagious diseases, with diagram showing comparative deaths from tuberculosis, and table showing deaths from tuberculosis grouped by counties.

Sixteenth Annual Report of the Provincial Board of Health of Ontario. Cloth, pp. 185, Toronto: Warwick Bros. & Rutter, 1897.

This report is for the year 1897, and besides tables and reports concerning other matters of public health, there is a chapter devoted to "Laboratories of Hygienic Research," in which comparisons are made of the work done in various laboratories in the States *i. e.*, Massachusetts and Pennsylvania; a chapter on "Laboratory Results in Serum Diagnosis of Diphtheria," one on "Air Purity as a Measure of Health," and an address on "House Sanitation in Relation to Consumption." Part 3 contains the annual report of various cities in the Province.

Clinical Report of the Rotunda Hospitals. By R. Dancer Purefor, M.D. Paper. Pp. 50. Illustrated. Dublin: Jno. Falconer, 1898.

This report covers the period from Nov. 6, 1896, to Oct. 31, 1897, and contains, besides many full-page plates, diagrams of the gynecologic department, and much data concerning cases in the Rotunda Lying-in Hospital for the above period.

Central Indiana Hospital for the Insane. Paper. Pp. 52. Indianapolis: Wm. B. Burford, 1898.

This, the 49th annual report of the Board of Trustees and Superintendents of the above hospital, covers the fiscal year ending Oct. 31, 1897, and contains matter referring to the administration of the hospital, various tabulations of admissions, discharges and deaths, and statements of revenue and disbursements.

Annual Report of the Department of Health of the City of Cincinnati. Cloth. Pp. 119. Maps. Cincinnati: The Commercial Gazette, 1898.

This report is well gotten up, on excellent paper and contains a diphtheria map, showing the relative distribution of deaths from diphtheria by wards during 1896 and 1897, and a consumption map, giving similar data relative to the distribution of deaths from consumption during this period. Other public health statistics are tabulated in handy form, but the volume lacks an index or table of contents, making it difficult to find the information contained therein.

A Preliminary Arrangement of the Species of the Genus Bacterium. By Frederick D. Chester. Paper. Pp. 94. From the ninth annual report of the Delaware College Agricultural Experiment Station, 1897, Newark, Del.

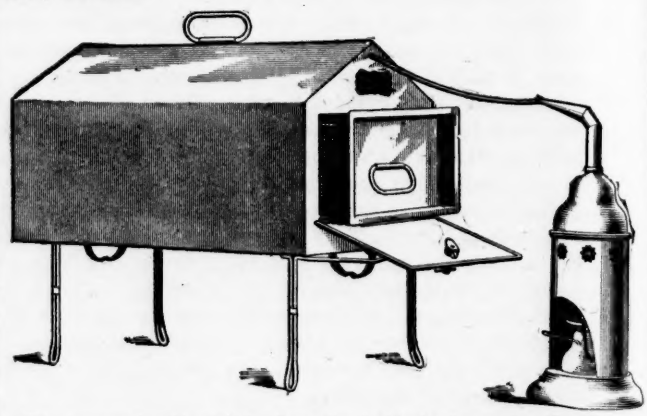
Part 1, "Contributions to Determinative Bacteriology," takes up characters of bacteria, description, classification, method of growth, species which follow growth on ordinary media, etc. The appendix contains a classification of bacteria associated with diseases of plants, and an index of the most important literature of the species of the genus bacterium.

NEW INSTRUMENTS.

NEW STERILIZER AND DEODORIZER.

BY JACOB R. JOHNS, M.D.
PHILADELPHIA, PA.

Formaldehyde is the gaseous disinfectant, par excellence, being incomparable to sulphur fumes, the chief agent of the past. Practically there are three sources of the gas, requiring vastly different apparatus for its liberation and application. In one form the gas is generated directly from wood alcohol on the principal of retarded combustion. In another form the gas is liberated from the paraform, or solid product. In the third style some form of the aqueous solution of commerce is employed. In all the above, heat is essential. In some the gas is liberated under considerable pressure, thus necessitating a bulky apparatus to guard against explosion. Simplicity of construction and economy are quite generally sacrificed, while in those employing wood alcohol there is always a considerable degree of uncertainty regarding the quantity of gas really involved.



The apparatus I wish to describe is that shown by the illustration. It is the most simple and economic yet suggested, while it is light, easily operated and absolutely free from dangers of any kind. The product employed is the 40 per cent. aqueous solution of commerce, which is decomposed by the heat from an ordinary alcohol lamp. The apparatus is designed especially for sterilizing surgical instruments and dressings, nursing bottles and kindred articles. For apartment disinfection, however small the apartment, the apparatus is totally inadequate. It consists, as will be observed, of a heating lamp, a device for collecting and delivering the gas and a closed sterilizing chamber. One ounce of the solution yields sufficient gas to disinfect the contents of the chamber. In employing this apparatus the author found the gas being liberated in large volumes within two minutes after lighting the lamp and in less than ten minutes the requisite amount of gas was liberated.

The process has the advantage of being perfectly dry, speedy and thorough. Cutting edges are not dulled nor handles injured.

The lamp is invaluable for deodorizing with formaldehyde gas, and when slightly modified by parts supplied may be used to medicate vapors or apply steam heat therapeutically. The apparatus is being introduced by H. K. Mulford Company.

NECROLOGY.

LOUIS E. BERTINE, M.D., (Bellevue, New York, 1881), of Mount Vernon, N. Y., died at his home May 30, the victim of a murderous attack. He was last seen alive May 28, at 11 P.M., when he parted with his brother after a joint attendance upon a public meeting in the Common Council Chamber. Nearly all the gaslights in the streets through which he had passed after leaving the central part of town were extinguished and it

is thought that in the darkness the assassin mistook him for an intended victim. Trephining was without avail and as he did not disturb his family on his arrival home, there only remains as a clue, a faint message sent by himself over the telephone to a police station that he had been struck by an unknown man. After this he was unconscious.

ROBERT TILLEY, M.D., a member of the staff of St. Luke's Hospital, Chicago, June 2, aged 55 years. St. Luke's Hospital staff passed the following resolution:

WHEREAS, Our friend and colleague, Robert Tilley, M.D., has passed from us,

Resolved, That we, the members of the Medical Board of St. Luke's Hospital, in Chicago, wish to extend and hereby do extend to his brother and his family our heartfelt sympathy; and wish to express to his many friends and to the medical profession our profound regret at the loss of an educated and earnest physician, a man ever courteous and kindly a friend just to himself and generous to the faults and failings of others.

JOHN BLAIR GIBBS, Assistant-Surgeon, U. S. A., of Richmond, Va., reported killed at Caimanero, Cuba, June 10.

M. B. COCHRAN, M.D., Iowa City, Iowa, May 29.——Josiah C. Cooper, M.D., Philadelphia, May 30, aged 77 years.——W. H. Drury, M.D., Columbus, Ohio, May 30, aged 65 years.——E. L. Hutton, M.D., Kansas City, Mo., June 1.——Wm. L. Kennett, M.D., LaCrosse, Wis., May 26, aged 71 years.——J. T. Lindsay, M.D., Yorkville, S. C., May 20, aged 76 years.——W. H. McNary, M.D., Martinsville, Ill., May 28, aged 77 years.——J. E. Moran, M.D., interne at the Cook County Hospital, Chicago, of Braidwood, Ill., June 1, aged 23 years.——W. C. Roberts, M.D., Maywood, Ill., June 4, aged 45 years.

DEATHS ABROAD.—Wilhelm Grube, formerly Professor of Surgery in the University of Charkow, aged 71 years.——Dr. Amadeo Marianelli, Extraordinary Professor of Dermatology and Syphilography in the Medical Faculty of Modena.

ASSOCIATION NEWS.

Minutes of the Denver Meeting.—We had expected to publish in full this week the minutes of the meeting, but have not received them from the Secretary. We are informed that all the resolutions reported from the Business Committee and acted upon at the Thursday session are still in the hands of the Secretary of that Committee. According to parliamentary usage, when a committee report is presented to a convention, the report then becomes the property of the convention, and unless referred back, the committee has nothing further to do with it. The JOURNAL being the official gazette of the ASSOCIATION, the minutes when published must be accurate, and we are therefore excluded from publishing any partial or reportorial report of the proceedings. Our readers therefore will please understand that the copy has not been furnished us.

Convention Notes.—Many old-timers were missed, but the registration reached nearly 1400.

The plan of holding the general reception at the principal hotel is an excellent one, and added very much to the comfort of the guests.

Owing to the increasing work of the ASSOCIATION, the feeling is growing that it might be well, after the first day, to hold the general sessions at night, and give up the private receptions altogether. These, while occasionally enjoyable, are burdensome and take time that could be spent quite as agreeably in general session.

The enterprise of the Denver newspapers caused the procurement of many photographs and biographies, several weeks in advance of the meeting, which were sufficient in number to enable the appearance of a fresh batch of photographs with new biographies each day. As they had been procured in advance of the meeting, some of them represented gentlemen not present, and in some cases those who had died. One of these papers one day had side by side a picture of a Washington bureau officer with a fulsome laudation, and a picture of the lamented Quimby. "Yes," said one observing it, "The living ass and the dead lion!"

Two ladies were going down the elevator at Brown's; they were discussing a paper on cremation that had been read in the State Medicine Section, one of them had been a widow twice. This lady, who was very handsome, was warmly advocating cremation. "I am not surprised that *you* should advocate cremation," rejoined the other, "for you have husbands to burn." The quiet that ensued was painful.

On the JOURNAL special a lady was talking with a bright young Chicago surgeon. "I wonder," said she, "if Dr. ——— will read one of his 'soul-stirring' papers at this meeting?" "No, madam," replied the young surgeon with becoming gravity, "His paper this year will stir up the duodenum, I believe."

The trip to Idaho Springs was thoroughly enjoyable. At that place the ladies gave a magnificent entertainment, which was on the same grand scale of giant hospitality as the grand mountains by which the guests were surrounded.

The Association Program.—There is on hand at this office a limited number of programs of the Denver meeting of the ASSOCIATION. The book will be sent to any member desiring a copy upon receipt of their request.

Correction.—In the JOURNAL of June 11, second column page 1431, line twenty-one from the bottom, read Floyd W. McRae instead of Alexander McRae.

SOCIETY NEWS.

Indian Territory Medical Association.—At the regular semi-annual meeting of this Association, which convened at Wagoner, I. T., June 1 and 2, the following officers were elected for the ensuing year: President, G. R. Rucker, Eufala; first vice-president, G. A. McBride, Ft. Gibson; second vice president, J. G. Rucker, Claremore; secretary, Leroy Long, Caddo. The next meeting will be at Wagoner, I. T., December next, the exact date to be fixed by the president and secretary.

MISCELLANY.

Pay of Army Medical Officers.—In answer to a few correspondents the JOURNAL states that in case of war a National guardsman serving in the volunteer service receives the same pay as in the regular army, which is for an assistant surgeon, $150 a month; a surgeon, $208.35, and a hospital steward $45. An acting assistant surgeon under monthly contract which carries with it privilege of resignation at will, receives as a rule $100 per month.

A Physician's Generosity.—Sir Richard Quain, before his death, presented to the Royal College of Physicians certain very interesting mementoes. Among these were four pieces of plate, one of them being a large silver bowl inset with medals won by him during his collegiate and university career. The most striking piece is a beautiful candelabra fitted for the electric light, which was a gift to Sir Richard Quain from a grateful patient, as also was a silver salver. Another silver salver bears an inscription stating that it was presented to him by the Pathological Society for services rendered to it as honorary secretary.

Only One Inquest Upon Body.—When a coroner has held an inquest upon view of the body, and has returned a verdict and filed the same with the clerk of the circuit court as provided by statute, the appellate court of Indiana decides in the case of the Board of Commissioners of Fountain County vs. Van Cleave, March 31, 1898, that he can not, upon his own motion, hold a second inquest and bind the county for the value of the services of a surgeon who makes an examination of the body at the coroner's request. The court says that the Indiana statute gives the coroner no power to hold more than one inquest, and the fact that the second inquest in question was held at the request of the friends of the deceased person it pronounces not material

for any purpose, except perhaps to show the good faith of the officer in holding the second inquest. Nor does it consider the case changed by the coroner calling the second one returned a supplemental verdict. It says that the length of time to be taken in the inquest proceedings and the thoroughness of the investigation are matters to be determined by the coroner, and if he returns a verdict upon an investigation too hastily made, the matter is at an end so far as he is concerned. This case was transferred to the appellate by the supreme court.

Modifications in the Blood of Syphilitics During Mercurial Treatment.—A large number of persons being treated with intravenous injections of sublimate and benzoate of mercury were examined with great care, and it was constantly found that the blood improved from the first; the red corpuscles and hemoglobin increased, with corresponding decrease in the number of leucocytes, as long as the amount was below 140 to 150 milligrams of sublimate. As soon as this limit is passed, the blood undergoes an intoxication which reduces the red corpuscles and hemoglobin and increases the number of leucocytes. With injections of considerable amounts of weak solutions (10 to 11 c.c. containing each 10 to 11 milligrams) the reconstituting effect on the blood constantly parallels the favorable therapeutic effect on the syphilitic eruptions and general health. With the benzoate, the intoxication commences at the limit of 77 milligrams.—*Presse Méd.*, May 18.

The Massachusetts State Medical Examiners.—We have heard a great deal from time to time here in New York about the Massachusetts system of medical examiners being superior to our system of coroners. Some doubt concerning its excellence, however, is suggested by an occurrence in the Massachusetts General Hospital, reported from Boston on Monday. It appears that a well-known resident of this city who was a patient in that institution committed suicide there on the 13th, inst. The return of his death made to the authorities declared that he died "from organic disease of brain, cirrhosis of liver, etc., laceration of brain and shock to nerves." The fact was that he shot himself in the head, but this circumstance was concealed until disclosed by the undertaker. Suicide is either a crime, the commission of which ought not to be hidden or if committed under circumstances which negative criminality, is so important an occurrence that the concealment of cases of self destruction is of very questionable propriety. We did not suppose that such cases could be concealed by the medical examiners under the Massachusetts statute.—*New York Sun.*

The International Health Exposition at New York.—New features are added from time to time to the above display. The public is especially attracted to the sanitary living pictures. Take for example the tenement-house "sweat shop," which is shown in actual operation, in contrast to a model workshop with all modern improvements; a police lodging room, redolent with damp and every kind of foulness, side by side with a model lodging house, such as may be seen opposite Bellevue Hospital; an old country poor-house cell, with a "mad woman" chained to the floor, in contrast to a modern insane asylum ward; a model school in contrast with an unmodel school, and so on with every department of practical hygiene. An interesting exhibit is that of the trained nurses of the world. In this department the latest medical and surgical appliances and all sick appurtenances are exhibited, together with examples of the most practical and best work of the nurses. In this exhibition the nurses of many American institutions have joined forces in order to give ther exhibit an educational value to those of their class who have or have not reached their post-graduate course. The nurses of other countries have been invited to co-operate. This exhibit contains a modern operating room and an obstetric room as arranged in a private house. There is bed making, cooking for the sick, the way to give medical baths and other lines of work that may properly be demonstrated in public.—*Charities Review*, May.

Death Caused by New Shoes.—About a week after a strong and healthy man commenced wearing a certain pair of new shoes, the friction of one of the shoes against one of his feet unexpectedly produced an abrasion of the skin of one of his toes. He gave the abrasion reasonable attention, but it nevertheless caused blood poisoning in about twenty days, which resulted in the man's death about a week later. Was his death produced "by bodily injuries effected by external, violent and accidental means," as this language would be used in a policy of accident insurance? The United States circuit court of appeals holds that it was, thus affirming the judgment of the court below in the case of the Western Commercial Travelers' Association vs. Smith. On the question of whether the abrasion of the skin of the toe was the natural and probable consequence of wearing new shoes, it says that it must be conceded that new shoes are not ordinarily worn with the design of causing abrasions of the skin of the feet; that an abrasion of the skin is certainly not the probable consequence of the use of new shoes, for it can not be said to follow such use more frequently than it fails to follow it; and that neither can such an abrasion be said to be the natural consequence of wearing such shoes, the consequence which ordinarily follows, or which might be reasonably anticipated.

The Difficulties of a Physician in India.—A medical man writes from Bombay: "Often when we pay our visits of inspections to native homes we find the head of the household sharpening a huge knife, wherewith he has pledged his word to his neighbors to stab the first doctor sahib who enters his household. In one village we entered we found over three thousand of the inhabitants had disappeared and gone to various hiding-places, whence they emerged as soon as we had finished our tour. Of course, we were helpless in the matter. We knew the population was missing, but could not scour the country and conduct our physical examinations by force. It would have been like an Afridi expedition. So we returned with our work only half done."—*Hospital.*

Birds to Produce Tuberculosis Antitoxin.—Prof. E. Behring's announcement, already mentioned, that he has found he can avoid the injurious after-effects of horse and other animal serum, to which consumptives seem especially sensitive, by substituting the serum from birds, is considered a forward stride in this form of therapeutics. The antitoxin furnishes a test for the uniformity and specificity of tuberculosis toxin, whether derived from bacilli washed and dried in the vacuum exsiccator of which one gram is equivalent to 1000 to 1250 M.: "Exsiccator Tb."; or 2, treated with alcohol first and then dried, "Alcohol Tb." of about the same strength as the "Exsiccator"; or 3, derived with alcohol from Koch's old tuberculin "Tub." equals 250 M.; or 4, with alcohol from dialysed culture fluid, "T. F. dial." equals 750 M.; or 5, extracted from the bacilli at 150 degrees C., air excluded, "TD."; or 6, the same as the last toxin, "TD.," isolated and concentrated, resulting in a very powerful toxin, "TDr." equivalent to 12,500 M. The various processes do not affect the nature of the toxin. An individual immunized against one is immune to them all, and the saving effect of the antitoxin is identical for them all. He is convinced that the specific toxin of the tuberculosis bacillus is in a tissue, enclosed in a fat- and mucin-containing shell, which can be rejected in isolating the toxin. He reports extensive tests in progress at the veterinary college in Berlin, which seem to promise fine results from the application to animals of the principles of Koch's tuberculin treatment of man. —*Vide* JOURNAL, page 1235; *Deut. Med. Woch.*, May 12.

Functions of the Cerebral Hypophysis.—De Cyon has continued his research on the thyroid gland and hypophysis, and now announces that any pressure, even the slightest, upon the hypophysis, immediately produces an abrupt variation in the blood-pressure and a marked retardation of the heart beat

which becomes much stronger at the same time. This pressure by stimulating the pneumogastric, starts the same mechanism as in the case of the thyroid gland (*vide* JOURNAL, xxix, p. 819), to divert from the brain a dangerous afflux of blood. Electric excitation of the hypophysis produces the same result, but with much greater intensity. In addition to this mechanical role, the hypophysis also produces a chemic substance, hypophysin or phosphoro-hypophysin, destined to facilitate the workings of its automatic mechanism.—*Semaine Méd.*, May 4.

Antipyrin Eruptions sometimes assume an erythematous, pigmented form, distressingly chronic. The *Annales de Derm. et de Syph.*, April, contains several instances. Intermittences have been observed in some cases, and in others certain patches have persisted many years, although no new ones have appeared notwithstanding the continued use of the drug. Some deepen in color with every fresh dose. Some cases acquire a tolerance in time and the patches disappear. In some the skin remains supple; in others it is infiltrated. The term antipyrinid is suggested for the group of toxidermias caused by this drug.

Circumscribed Lymphangioma of the Skin and Mucosa develops at the expense of the dermic lymphatic vascular system, although the sanguine vascular system is also involved to a certain extent. Brocq claims a distinct place for it in cutaneous pathology, apart from simple, diffuse lymphangioma, which on the tongue is a variety of macroglossia. It is also to be distinguished from cystic lymphangioma, which includes the serous cysts of surgical pathology, and also from the various kinds of lymphangiectasis which may simulate it both clinically and histologically.—*Ann. de Derm. et de Syph.*, April.

Oriental Regions Having Philippine Conditions.—Mr. Caspar Whitney, an American globe-trotter of note, has been exploring parts of Sumatra and Malacca, the jungles of which are but little known in this country. Some of his observations in *Harper's Weekly* are of interest to medical men. The jungle is unhealthy, especially during the rainy season, but Mr. Whitney says illness at no time interfered with his hunting plans, although his health was poor a good deal of the time, in spite of the fact that he never slept on the ground; always slept in the smoke of a fire, boiled and filtered all water (which was wretched in quality) before drinking and took quinin moderately. In spite of these precautions he had attacks of both fever and dysentery, but escaped the terrible prostration which usually accompanies them in that climate, probable because of the above precautions coupled with great care as to diet. His precautions would seem to preclude nearly all chance of air or water infection of the malaria. Of mosquitoes he says nothing and it is to be hoped he will do so in later reports of his expedition, as late studies show infection is often carried by these insects.

Naval Preparations at the New York Navy Yard.—Medical Director Bloodgood, retired, U. S. N., of Brooklyn, has been receiving contributions of delicacies at the Brooklyn Navy Yard for the use of sick and wounded sailors in the navy. He reports to the Navy Department that the women of the country are acting in a most generous manner in their patriotic work. A great number of women's organizations have sent quantities of supplies of all varieties to the Brooklyn yard, intended for distribution to the sailors of Captain Sampson's fleet. Jellies, fruit, cans of soups and broths, lemons and considerable money have been received. All of this is to be stored at Brooklyn until the Hospital ship *Solace* returns from the South with her first load of invalids. As soon as the *Solace* reaches Captain Sampson's fleet it is to take on board all the men who are ill and incapacitated for work. She will remain South as long as there is prospect of a naval fight and will only return to the North when her wards are filled with sick and wounded. It is the intention to bring these patients direct to Brooklyn and to turn them over to the surgeons at that yard. The new naval hospital, just completed at the Brooklyn Navy Yard, is to be utilized for this purpose and it is likely that the first men to be sent there will be those injured in a fight with the Spanish.

Medical Comforts for the Sick of the Army.—The following memorandum from Surgeon-General Sternberg of the army embodies his reply to women's relief associations, societies and individuals who have written requesting him to direct their benevolent and patriotic efforts on behalf of the sick and wounded:

"Having received numerous letters from patriotic ladies asking what articles would be most acceptable for the use of our sick and wounded soldiers in the field or in hospital, I have prepared the following memorandum to be sent in reply to letters of inquiry. Money may be sent to the Surgeon-General of the Army as a contribution to the hospital fund of the hospital ship *Relief* and of United States general hospitals. This will be sent to the surgeons in charge, to be expended for delicacies for the sick, such as canned soups, jellies, lemons, oranges, etc. Those who prefer may contribute canned soups, clam broth, orange marmalade, ginger ale, Albert biscuit, Bent's water crackers, and similar articles in hermetically sealed cans for use on the hospital ship *Relief* and at the United States general hospitals at Key West, Fla., Fort McPherson, Ga., Fort Thomas, Ky., and at Fort Myer, Va. Bandages, lint and other surgical dressings are not desired, as these can now be obtained from the manufacturers sterilized for use and of the quality which experience has shown to be best suited to our purposes. Shirts and drawers are provided by the Government, but will be accepted and can be given to convalescents upon their discharge from hospital. Pajamas made of light gingham will be useful for the sick in hospital and on the hospital ship, as they can be worn by convalescents who are able to be out of bed. Long nightshirts of light muslin can also be utilized. Broad bandages of light flannel to protect the abdomen are highly recommended and may be worn to advantage by our soldiers in the field. The articles mentioned may be sent direct to the Surgeon-general of the Army, or to the surgeons in charge of the general hospitals named."

Post-operative Mental Disorders are much discussed just now on both sides of the Atlantic, and the majority incline to the opinion that a mind unbalanced by an operation was not worth much before, that is, mental disorders rarely follow an operation except in the predisposed. Instances have been related of a psychosis following the use of chloroform, and prevented by substituting ether when a second operation became necessary. The confinement and surroundings are frequently responsible for a psychosis following an operation on a person from the country, especially elderly farmers or farmers' wives. Some refuse to operate when there is excessive dread of the operation, and Gerard-Marchant observes that mental disorders are almost certain to follow an operation on a "false gonorrheic," or a subject with varicocele, or a young neurasthenic woman with the triad: renal ptosis, gastric dilatation and slight metritis. No benefit is ever derived by the patient in these cases, from the operation, and the surgeon only prepares trouble for himself. Le Dentu has had twenty-three cases of psychosis consecutive to an operation, and commenting upon them and sixty-eight in literature, concludes that the assumed connection between such disorders and operations on the genital organs is sustained by the facts observed, adding that there is a certain class of purely cerebral post-operative delirium of which the pathogenesis is still a mystery.

Gleanings.—Four cases of tuberculosis and carcinoma associated, the former evidently the primary affection; three intestinal and one in a lung cavity.—*Virchow's Archiv.*, 148, 149. ——Case of subjective parosmia, constant odor of putrefaction perceived, cured by galvanocauterizing the hypertrophied mucosa of the middle turbinate bones.——Lactic acid recommended as the specific for tuberculous lesions especially in laryngeal tuberculosis, preceded by curetting.——Cure of gangrenous diphtheritic angina complicated with mastoiditis, treated by trephining the mastoid abscess. This should inva-

riably be done without reference to the other conditions.—— Perforations of the tympanum closed by cauterizing every eight or ten days with trichloracetic acid, alternating with radiating incisions in severe cases. Hearing improved more or less in forty-nine out of fifty one cases thus treated; deafness aggravated in two.—French Congress of Otology and Laryngology. ——Importance of syphilis as a possible factor in ulcer of the stomach. Instances more frequent than supposed. Specific treatment will cure without an operation.—Paris Acad. de Méd., May 17.—— Chorea assumed to be merely the cerebro-medullary manifestations of rheumatic infection in a hysteric or neurasthenic.—Moncorvo of Rio Janeiro.——Spinal ganglia in the lower animals still enclosed in the medulla, descending lower and lower as we ascend the scale, until in man and in birds they emerge through the intervertebral foramina.—*Semaine Méd.*, May 18.

The Koran not Antagonistic to Vaccination.—Dr. Loir, director of the Tunis Pasteur Institute, in a recent communication to the Academie de Médecine of Paris, noting the prevalence of smallpox in the Algerian Protectorate, stated that in order to get the Mohammedans to permit vaccination it is essential to obtain from the Tunisian religious authorities a declaration that the procedure is not forbidden by the Koran. Dr. Laveran referred to a thesis by Dr. Bechir-Dinguizle, in which he states that, by inquiry among the superior Mohammedan clergy of Tunis, he ascertained that vaccination does not clash with any religious belief of the country.—*Phila. Med. Jour.*

Philadelphia.

APPOINTMENTS TO PHILADELPHIA (BLOCKLEY) HOSPITAL.—This hospital of over four thousand beds, the largest in the United States, is always an objective point to the student while at medical college in Philadelphia, and the different colleges are proud to have their students appointed to the different positions on the medical and surgical staff. At the recent examination ninety-three students presented themselves for the twenty-five vacancies. Of these, fifty-five were from the University of Pennsylvania, twenty from the Medico-Chirurgical College and seven from the Jefferson Medical College. Seven were women, but none of the latter received the necessary average (70) for the appointment. Of those appointed, fifteen are from the University of Pennsylvania and ten from the Medico-Chirurgical College. Dr. Henry C. Chapman, professor of institutes of medicine and medical jurisprudence at the Jefferson College, in speaking for the candidates from that college is quoted as saying: "We had only a 'scratch class,' as this is an off year. Three years ago we changed the course to a four-year one and this is only the fourth year, so we did not expect to have any graduating class at all. The men graduated came from other schools and made a small class of fifty, and only seven presented themselves for examination. Taking the large number of students from other colleges, a very large percentage of them failed, as the examination is a very severe one."

PATIENT WITH A BROKEN NECK LIVES A YEAR.—John K., a lad 9 years of age, living in Camden, N. J., fell from a tree June 9, 1897, sustaining a fracture of the cervical vertebra. The X-ray was applied and confirmed the diagnosis, locating the spicula of bone pressing against the spinal cord. Laminectomy was performed and the fragments of bone removed. The boy subsequently regained consciousness and by means of appliances was able to be carried in an invalid chair about the grounds of Cooper Hospital. Death occurred June 1, 1898.

DR. JOHN GUITERAS FURTHER HONORED.—Dr. John Guiteras of Philadelphia, Professor of Pathology in the University of Pennsylvania, who was sent to Tampa some time ago by the government, has recently been appointed a brigade surgeon with the rank of major. It is stated that Dr. Guiteras has formulated the necessary health rules for the guidance of troops against contracting the yellow fever while in Cuba. He will accompany the United States army in its campaign for free Cuba, and his services will be of incalculable advantage, owing to the fact that the fighting will be on his native soil.

PENNSYLVANIA HOSPITAL.—At a recent meeting of the staff of the above-named hospital Dr. James W. Wister was elected to fill the vacancy on the staff caused by the expiration of the term of Chief Surgeon W. J. Roe, which occurs July 1. Dr. Clarence de F. Leidy will then be promoted to the position of surgeon.

MORTALITY STATISTICS for the week ending June 4, there were 406 deaths, being a decrease of 3 over the previous week, but an increase of 39 over the corresponding week of last year. Of these, 120 occurred in children under 5 years of age. The causes of death were: from diphtheria 15, typhoid fever 7, scarlet fever 2, against 10, 8 and 4 for the week preceding.

Cincinnati.

ACADEMY OF MEDICINE, May 30.—Dr. Meyer Heidingsfeld reported a case of nævus vasculorum which he had treated for two months, by electrolysis. The patient was 17 years of age, nevus superficial and of a dark red color situated over the right temple. It presented an elliptic outline in the form of a broad band varying from one half to one inch in width, two and a half inches in breadth and three and a half in length. The center of the ellipse was not involved, save two small circular areas each the size of a half dime. This elliptic band involved the middle of the right eyebrow, upper and lower lid, and the anterior part of the hairy scalp. Treatment: Galvanic electrolysis, two m.a. in strength one-half minute for each insertion of the needle. The latter was inserted parallel to the surface of the skin as superficially as possible. In all there had been nine sittings, each on an average of one and one-quarter hours duration. A 2 per cent. solution of cocain was injected hypodermically before treatment. The areas in close proximity to the eyelids and those covered with hair were left untreated, and still possess the color and appearance of the original nevus. The cosmetic effect has been excellent, the treated area in almost its entirety showing but a vestige of the original color, and contrasting strongly with the cherry red of untreated portions. Inflammatory reaction has been apparently slight, and there are as yet no evidences of cicatrization or deformity, the affected skin being almost as soft and pliable as normal. The same speaker also presented a case of psoriasis vulgaris of the nummular type in a child two and a half years old. The efflorescences, which were only of two months standing, were particularly bright red in color, quite large and numerous, and coalescing over certain areas to form placques four and five inches in either direction, and broad bands several inches in length. These bands followed, for the most part, the lines of cleavage of the skin. The distribution was very extensive, involving all the extremities, a large portion of the body, and nearly the entire scalp. Alopecia was associated. Only one finger nail showed deformity and the knees and elbows were singularly enough but little involved. No history of heredity could be elicited. Discussion was by Drs. Caldwell, Drury, Ricketts, and the speaker. Dr. Ricketts exhibited a specimen of a case of tubercular tumor involving the large intestine about a foot from the ileocecal valve; the mesentery opposite was also the seat of a similar enlargement. Intussusception of the valve into the large intestine had occurred, and had drawn with it an appendix twelve inches in length. Obstruction was not complete. The case was very like that reported by Senn a few weeks ago. Dr. Judkins exhibited a specimen of a case of aneurysm of the arch of the aorta which extended forward and eroded the sternum, producing a large external tumor. The case was presented at the Academy several months ago; the skin was not broken at that time. Several weeks after, the integument necrosed and a slight hemorrhage occurred which, however, was readily controlled by the application of dried persulphate of iron and slight compression. About a week ago a severe hemorrhage took place which was rapidly fatal. Dr. Max Thorner read "Cholesteatoma of the Mastoid."

AT the regular meeting of the Society for Original Research, Professor Edwards of the Cincinnati University read a paper on "New Problems in Biology."

THE Tenth Annual Meeting of the American Pediatric Society was held in Cincinnati, June 1, 2 and 3. The evening of June 1, a reception was given by Drs. Forchheimer and Rachford at Chester Park, to which the members of the local profession were invited.

Washington.

HEALTH OF THE DISTRICT.—The report of the Health Officer for the week ended May 21, shows the total number of deaths to have been 90, of which 49 were white and 41 colored. Twenty-one were under 5 and twenty-four over 60 years of age. The principal causes of death were: Diseases of the lungs, 15; nervous diseases, 12; typhoid fever, 3; and one death each from diphtheria, scarlet fever and measles. At the close of the week there were thirty-seven cases of scarlet fever under treatment.

THE report for the week ended May 28, shows the total number of deaths to have been 96, of which number 51 were white and 45 colored. Among the principal causes of death were: Diseases of the nervous system, 11; circulatory, 7; genito-

urinary, 9; respiratory, 23. There were two fatal cases of typhoid fever, diphtheria, measles, whooping-cough and la grippe. There were 41 cases of diphtheria and 41 cases of scarlet fever under treatment at the close of the week.

DRS. Louis J. Battle, Will Fred M. Barton, S. Clifford Cox, Francis R. Hagner and John L. Norris, have been appointed physicians to the poor at $360 per annum.

MEDICAL SOCIETY.—At the recent meetings of the Society the following papers were read: M. F. Thompson, "Hydrophobia;" Dr. Burnette, "Gangrene of Eyelids and Cheeks, with Destruction of Both Eyeballs Resulting from Human Bites;" Dr. Acker, "Empyema and Purulent Pericarditis, case and specimens;" G. W. Johnston, "The Necessity of Accuracy and Uniformity in Chemic Laboratory Investigations;" G. Wythe Cook, "Cancer of the Stomach, case and specimen;" W. W. Johnston, "Sarcoma of the Lung, case and specimen;" Report of Committee on Public Health; Dr. Reyburn, "The Use of Expectorants;" Dr. Butler, "Nasal Polypus;" Dr. Lamb, "Hydronephrosis in a Calf; specimen."

WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.—The 282d meeting of the Society was held on the 20th ultimo at the residence of Dr. Balloch. Dr. Van Renssalaer reported the removal of a large uterine polypus from a patient over 90 years of age.

EMERGENCY HOSPITAL.—Dr. Jeunemann's term of resident physician having expired, Dr. Fife, the first assistant resident, will be promoted to the office of resident physician. The competitive examination recently held to fill the office of first and second physician, resulted in the selection of M. W. Glover of the Georgetown Medical School and F. H. Mohart of the Columbian Medical School.

Dr. Ralph E. Gallinger, son of the Senator from New Hampshire, is quite ill at the New York City Hospital. Dr. Gallinger is one of the Assistants to the Staff of the Hospital.

Dr. Francis Leber has resigned from the Assisting Staff and joined his regiment at Key West, Fla. He has recently been appointed an acting Assistant Surgeon in the U. S. Army.

Miss Margaret Schaffer, the nurse in charge of the sterilizing department of the Hospital has resigned, to accept a position as Army nurse in the Hospital Corps of the D. A. R. Miss Schaffer has the distinction of being one of the four nurses first called to the Military Hospital Corps.

WOMAN'S CLINIC.—At the recent meeting of the Woman's Clinic, the Hospital was reported to be in a flourishing condition; 617 patients were treated in March and 460 in April. Miss Eva Simonton, Sup't. Central Dispensary and Emergency Hospital was elected a member of the Board of Directors. Dr. Isabell Haslup was elected a member of the attending staff.

EPISCOPAL EYE, EAR AND THROAT HOSPITAL.—The report of the work done in the Hospital for the past four months shows 530 patients were treated, of whom 249 were white and 236 colored. Two thousand and thirty visits were made to the different departments. Seventy-one patients have been received into the Hospital, of which 39 were free and 32 pay patients. The sum of $2256.16 has been collected for the Hospital since January 1; 92 operations have been performed during the past four months.

CONTRIBUTIONS TO MILITARY HOSPITALS.—Surgeon-General Sternberg, in reply to numerous inquiries from persons desiring to make contributions to the wounded soldiers in the field, has issued the following general reply: Money may be sent to the Surgeon-General of the army as a contribution to the hospital funds of the hospital ship *Relief* and of the U. S. general hospitals. This will be sent to the surgeons in charge, to be expended for delicacies for the sick, such as canned soups, oranges, etc. Those who prefer, may contribute canned soups, clam broth, orange marmalade, ginger ale, biscuit, water-crackers, and similar articles in hermetically sealed cans for use on the hospital ship *Relief* and the U. S. General Hospitals, at Key West, Fla.; Fort McPherson, Ga.; Fort Thomas, Ky., and Fort Myer, Va. Bandages, lint and other articles are not desired as these can be obtained from the manufacturers sterilized for use and of the quality which experience has shown best suited. Shirts and drawers are provided by the government, but will be accepted and can be given to convalescents upon their discharge from hospital. Pajamas made of light gingham will be useful for the sick in hospital and on the hospital ship, as they can be worn by convalescents who are able to be out of bed. Long nightshirts of linen muslin can also be utilized. Broad bandages of light flannel to protect the abdomen are highly recommended and may be worn to advantage by our soldiers in the field. The articles mentioned may be sent direct to the Surgeon-General of the army or to the surgeons in charge of the general hospitals named.

DR. AINSWORTH RECOVERING.—Dr. F. C. Ainsworth, Colonel U. S. army, who has been seriously ill for the past month, is considerably improved, and will shortly resume his duties in the War Department.

MISS Amanda J. Armistead of the Central Dispensary and Emergency Hospital, has been appointed by Surgeon-General Sternberg, nurse to the Hospital Relief Corps of the D. A. R. This is the second nurse appointed from this institution to the Army Corps.

MICROSCOPICAL SOCIETY.—At the meeting of the Society, held on the 31st ultimo, the program of the evening was: Exhibition of a high power projection lantern with arc light and slides including living objects.

WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.—At the 283d meeting of the Society, held on the 3d instant, Dr. William M. Sprigg read a paper on "Pessaries;" an interesting discussion followed.

Colleges.

THE COLUMBIAN UNIVERSITY, Washington, D. C., held its seventy-seventh annual commencement June 1.——The graduating class of the University College of Medicine, Lynchburg, Va., numbered forty-nine at the annual commencement, May 26.——The Woman's Medical College of the New York Infirmary for Women and Children held its thirteenth annual commencement May 26.——The Atlanta Medical and the Southern Medical Colleges of Atlanta, Ga., have united.

Societies.

The following recent meetings are noted:

Indiana.—Vigo Medical City, Terre Haute, June 2.

Maine.—Maine Medical Association, Portland, June 1-3.

Minnesota.—Minneapolis Academy of Medicine, June 1.

Missouri.—Medical Society of City Hospital Alumni, St. Louis, June 2.

New Jersey.—Atlantic County Medical Society, Atlantic City, May 26.

New York.—Medico-Chirurgical Society, Syracuse, June 2; Otsego County Medical Society, Cooperstown, May 31; Queens County Medical Society, Mineola, L. I., May 31; Ulster County Medical Society, Kingston, May 31.

Ohio.—Butler County Medical Society, Hamilton, June 1; Clark County Medical Association, Springfield, June 2; Cleveland Medical Society, May 27.

Medical Colleges in the United States in active existence Jan. 1, 1898, to which recognition, partial or complete, is accorded by the Illinois State Board of Health:

ALABAMA.—Medical College of Alabama (Med. Dept. University of Alabama), Mobile.

ARKANSAS.—Arkansas Industrial University, Medical Department, Little Rock.

CALIFORNIA.—California Medical College, San Francisco. College of Medicine of the University of Southern California, Los Angeles. Cooper Medical College, San Francisco. Hahnemann Hospital College, San Francisco. Medical Department of the College of Physicians and Surgeons, San Francisco. Medical Department of the University of California, San Francisco.

COLORADO.—Denver Homeopathic Medcal College and Hospital, Denver. Gross Medical College, Denver. University of Colorado (Colorado School of Medicine), Boulder. University of Denver, Department of Medicine, Denver.

CONNECTICUT.—Yale University, Department of Medicine, New Haven.

DISTRICT OF COLUMBIA.—Georgetown University, School of Medicine. Howard University, Medical Department. National Medical College, Medical Department Columbian University. Medical Department, National University.

GEORGIA.—Atlanta Medical College, Atlanta. Georgia College of Eclectic Medicine and Surgery, Atlanta. Medical College of Georgia, Augusta. Southern Medical College, Atlanta.

ILLINOIS.—Bennett College of Eclectic Medicine and Surgery, Chicago. Chicago Homeopathic Medical College, Chicago. Chicago Physio-Medical College, Chicago. College of Physicians and Surgeons, Chicago. Dunham Medical College, Chicago. Hahnemann Medical College and Hospital, Chicago. Harvey Medical College, Chicago. Hering Medical College, Chicago. Illinois Medical College Chicago. Jenner Medical College, Chicago. National Medical College, Chicago. Northwestern University, Medical School (Chicago Medical College), Chicago. Northwestern University. Woman's Medical School, Chicago. Rush Medical College, Chicago.

INDIANA—Central College of Physicians and Surgeons, Indianapolis. Fort Wayne College of Medicine, Fort Wayne. Medical College of Indiana, University of Indianapolis, Indianapolis. Physio-Medical College of Indiana, Indianapolis.

IOWA.—College of Physicians and Surgeons, Keokuk. Homeopathic Medical Department, University of Iowa, Iowa City. Iowa College of Physicians and Surgeons, Des Moines. Keokuk Medical College, Keokuk. Medical Department, University of Iowa, Iowa City. Sioux City College of Medicine, Sioux City.

KANSAS.—College of Physicians and Surgeons (Medical Department Kansas City University), Kansas City. Kansas Medical College, Topeka.

KENTUCKY.—Hospital College of Medicine, Louisville. Kentucky School of Medicine, Louisville. Louisville Medical College, Louisville. Southwestern Homeopathic Medical College, Louisville. University of Louisville, Medical Department, Louisville.

LOUISIANA.—Medical Department, Tulane University, New Orleans. New Orleans University, Medical Department, New Orleans.

MAINE.—Maine School of Medicine at Bowdoin College, Brunswick.

MARYLAND.—Baltimore Medical College, Baltimore. Baltimore University, School of Medicine, Baltimore. College of Physicians and Surgeons, Baltimore. Johns Hopkins Medical School, Baltimore. Southern Homeopathic Medical College and Hospital, Baltimore. University of Maryland, School of Medicine, Baltimore. Woman's Medical College, Baltimore.

MASSACHUSETTS.—Boston University School of Medicine, Boston. Harvard University Medical School, Boston. Tufts Medical College, Boston.

MICHIGAN.—Detroit College of Medicine, Detroit. Homeopathic Medical College of the University of Michigan, Ann Arbor. Michigan College of Medicine and Surgery, Detroit. University of Michigan, Department of Medicine and Surgery, Ann Arbor.

MINNESOTA.—University of Minnesota, College of Medicine and Surgery, Minneapolis. University of Minnesota, College of Homeopathic Medicine and Surgery, Minneapolis.

MISSOURI.—American Medical College, St. Louis. Barnes Medical College, St. Louis. Beaumont Hospital Medical College, St. Louis. Central Medical College, St. Joseph. Ensworth Medical College and Hospital, St. Joseph. Homeopathic Medical College of Missouri, St. Louis. Kansas City Homeopathic Medical College, Kansas City. Kansas City Medical College, Kansas City. Marion Sims College of Medicine, St. Louis. St. Louis College of Physicians and Surgeons, St. Louis. St. Louis Medical College, St. Louis. University Medical College, Kansas City. Woman's Medical College, Kansas City.

NEBRASKA.—John A. Creighton Medical College, Omaha. Omaha Medical College (Medical Department University of Omaha), Omaha. Lincoln Medical College of Cotner University, Lincoln.

NEW HAMPSHIRE.—Dartmouth Medical College, Hanover.

NEW YORK.—Albany Medical College, Albany. Bellevue Hospital Medical College, New York. College of Physicians and Surgeons of Columbia University, New York. Eclectic Medical College of the City of New York, New York. Long Island College Hospital, Brooklyn. Medical Department Niagara University, Buffalo. New York Medical College and Hospital for Women, New York. New York Homeopathic Medical College and Hospital, New York. New York University Medical College, New York. Syracuse University College of Medicine, Syracuse. University of Buffalo, Medical Department, Buffalo. Woman's Medical College of the New York Infirmary, New York.

NORTH CAROLINA.—Leonard School of Medicine, Raleigh.

OHIO.—Cincinnati College of Medicine and Surgery, Cincinnati. Cleveland College of Physicians and Surgeons, Cleveland. Cleveland Homeopathic Medical College, Cleveland. Eclectic Medical Institute, Cincinnati. Laura Memorial College, Cincinnati. Medical College of Ohio, Cincinnati. Medical College of the Western Reserve University, Cleveland. Miami Medical College, Cincinnati. Ohio Medical University, Columbus. Pulte Medical College, Cincinnati. Starling Medical College, Columbus. Toledo Medical College, Toledo.

OREGON.—Medical Department Williamette University, Salem. University of Oregon, Portland.

PENNSYLVANIA.—Hahnemann Medical College and Hospital, Philadelphia. Jefferson Medical College, Philadelphia. Medico-Chirurgical College of Philadelphia, Philadelphia. University of Pennsylvania, Department of Medicine, Philadelphia. Western Pennsylvania Medical College, Pittsburg. Woman's Medical College of Pennsylvania, Philadelphia.

SOUTH CAROLINA.—Medical College of the State of South Carolina, Charleston.

TENNESSEE.—Chattanooga Medical College, Nashville. Medical Department University of the South, Sewanee. Medical Department University of Tennessee, Nashville. Meharry Medical College, Nashville. Memphis Hospital Medical College, Memphis. Tennessee Medical College, Knoxville. University of Nashville, Medical Department, Nashville. Vanderbilt University, Medical Department, Nashville.

TEXAS.—Medical Department University of Texas, Galveston.

VERMONT.—Medical Department of the University of Vermont, Burlington.

VIRGINIA.—Medical College of Virginia, Richmond. Medical Department University of Virginia, Charlottesville. University College of Medicine, Richmond.

WISCONSIN.—Milwaukee Medical College, Milwaukee. Wisconsin College of Physicians and Surgeons, Milwaukee.

The above list, which has been carefully revised, includes every reputable medical college in the United States known to the Illinois State Board of Health. Of the institutions named, several are recognized unconditionally during all years, others are in good standing in certain years only, a neglect to comply with the requirements of the Board causing conditional recognition during some periods, and to a not inconsiderable number is granted conditional recognition only during all years of existence. Specific information in the case of any college named, or in relation to extinct institutions will be forwarded on request. To existing institutions not named, no recognition whatever is given by the Illinois State Board of Health.

J. A. EGAN, M.D., Secretary.

CHANGE OF ADDRESS.

Buchard, W. M., from Lemon City, Fla. to Uncasville, Conn.
Brown, J. R., from 8 Sterling to 1014 Central Ave, Indianapolis, Ind.
Campbell, C. H., from Iowa City, Iowa, to Osceola, Neb.
Campbell, A. M., from Detroit to Hazlett Park, Mich.
De Lee, J. B., from 3318 Indiana Ave. to 3634 Prairie Ave., Chicago, Ill.
Emmerson, R., from 813 Harrison St. to 301 E. 31st St., Chicago, Ill.
Frahm, M., from Chicago to Tuscola, Ill.
Gage, M. R., from Phœnix, Ariz. to Sparta, Wis.
Goetsch, G. A., from 403 S. Lincoln St. to 857 W. North Ave., Chicago.
Hotvedt, I. J., from 907 to 912 21st Ave., So. Minneapolis, Minn.
Jaquith, W. A., from 491 LaSalle Ave. to 1184 Wilcox Ave., Chicago, Ill.
Josephson, D. V., from 155 S. Sangamon to 317 W. 12th St., Chicago, Ill.
McCreery, from DesMoines to Pioneer, Iowa.
Mason, L. D., from Brooklyn, N. Y. to Greenwich, Conn.
McEwen, from 191 S. Lincoln St. to County Hospital, Chicago, Ill.
Pearse, H. E., from 1018 E. 15th St. to 312 Rialto Building, Chicago, Ill.
Pleth, V., from 759 to 740 W. North Ave., Chicago, Ill.
Roach, J. U., from Primroy to Sill, Tenn.
Spaulding, H., from 3351 Indiana Ave. to 3133 Rhodes Ave., Chicago.
Sylvester, H., from Mineral Point to 132 Grand Ave., Milwaukee, Wis.
Smolt, C. F., from Newton to Hutchinson, Kan.
Smith, P. C., from Indianapolis, Ind. to Charlotte, Mich.
Scott, J. W., from Springfield to Venice, Ill.
Thompson, J. F., from 14th and H St. to 804 17th St., N. W., Washington, D. C.
Teigen, M. O., from 408 Nicollet St. to 660 Temple Court, Minneapolis.
Thorp, C. W., from Denver Athletic Club to McPhee Building, Denver, Colo.
Warner, J. W., from New York to 19 York Ave., Saratoga, N. Y.

LETTERS RECEIVED.

American Embossing Co., Buffalo, N. Y.
Baltimore Medical College, Baltimore, Md.; Bell, F. C., Chicago, Ill.; Breedlove, J. W., Fort Smith, Ark.
Chicago Eye, Ear, Nose and Throat College, Chicago, Ill.; Chaille, S. E., New Orleans, La.
Dewey, C. R., Coloma, Mich.; Dulomy, R. W., Jonesboro, Tenn.
Foster, G. A., Wilkinsburg, Pa.; Frazier & Co., N. S., Aurora, Ill.; Fuller Advertising Agency, C. H., Buffalo, N. Y.
Grant, Thomas Page, Louisville, Ky.
Hennacy, Geo. W., Clinton, Iowa; Hektoen, L., Chicago, Ill.; Hatch, W. Grant, Prairie City, Ill.; Henry, C. W., Coon Rapids, Iowa.
Johns, J. R., Philadelphia, Pa.
Larew, Jno. T., St. Louis, Mo.; Lehn & Fink, New York, N. Y.
McCurdy, S. L., Pittsburg, Pa.; Mansfield, L. F., Watertown, N. Y.; Malster, R. M., Omaha, Nebr.
Newell & Heldman, Chicago, Ill.
Opie, Thomas, Baltimore, Md.
Pearson, W. W., DesMoines, Iowa; Philadelphia Medical Journal, Philadelphia, Pa.
Richardson, H., Mount Hope Retreat, Md.
Smith, W. O., New Castle, Pa.
Vaughan, V. C., Ann Arbor, Mich.
Wells, F. A., Garden Creek, N. C.; Wellner, Hermann, Concord, N. H.

THE PUBLIC SERVICE.

Army Changes. Official List of Changes in the Stations and duties of officers serving in the Medical Department, U. S. Army, from June 4 to 10, 1898.

Acting Asst. Surgeon James H. McCall, U. S. A., will proceed from Huntingdon, Tenn., to Ft. McPherson, Ga., and report for duty in the general hospital at that place.

Acting Asst. Surgeon W. P. Chamberlain, U. S. A., will proceed from Washington, D. C., to Ft. Monroe, Va., and report for duty.

Capts. Frank R. Keefer and Paul F. Straub, Asst. Surgeons, will report to the commanding General, Dept. of the Pacific, for duty with the expedition to the Philippine Islands.

Acting Asst. Surgeon Thomas R. Marshall, U. S. A., will proceed from Richmond, Va., to Tampa, Fla., and report for duty with troops in the field.

Acting Asst. Surgeon George H. Penrose, U. S. A., will proceed from Ft. Douglas, Utah, to San Francisco, Cal., and report for duty with the Utah batteries for the expedition to the Philippine Islands.

Acting Asst. Surgeon A. S. Condon, U. S. A., will proceed from Ogden, Utah, to Ft. Bayard, N. M., and report for duty.

Acting Asst. Surgeon T. S. Dabney, U. S. A., order assigning him to Tampa, Fla., is revoked, and he is ordered to Jackson Bks., La., for duty.

Acting Asst. Surgeons Richard P. Strong and Henry E. Wetherill, U. S. A., ordered to Tampa, Fla., for duty.

Acting Asst. Surgeon Edward Schreiner, U. S. A., ordered to Ft. McPherson, Ga., for duty in general hospital.

Acting Asst. Surgeon Frederick McG. Hartsook, U. S. A., ordered to U. S. hospital ship "Relief."

Capt. Alfred E. Bradley, Asst. Surgeon, ordered to Camp Alger, Falls Church, Va., for duty with Second Army Corps.

Capt. Edgar A. Mearns, Asst. Surgeon, ordered to Camp George H. Torney, Chickamauga National Park, Ga.

Acting Asst. Surgeon James B. Ferguson, U. S. A., ordered from Olivia, Minn., to Ft. Yellowstone, Wyo., for duty.

Acting Asst. Surgeon Rupert Norton, ordered to Ft. McPherson, Ga., for duty in general hospital at that place.

Capts. Frederick P. Reynolds and George J. Newgarden, Asst. Surgeons, having reported in person to the Surgeon-General of the Army, are ordered to Tampa, Fla., for duty with cavalry division.

Capt. James D. Glennan, Asst. Surgeon, is relieved from duty with Sixth U. S. Cavalry, and ordered to Camp George H. Thomas, Chickamauga Park, Ga.

Capt. William P. Kendall, Asst. Surgeon, is relieved from duty with the Ninth U. S. Cavalry, and will proceed to Camp George H. Thomas, Chickamauga National Park, Ga.

Capt. Henry R. Stiles, Asst. Surgeon, ordered to Tampa Fla., for duty with Fifth Army Corps.

Capt. William Stephenson, Asst. Surgeon, is relieved from duty with Fourth U. S. Infantry, and ordered to Camp George H. Thomas, Chickamauga National Park, Ga., for duty with First Army Corps.

Capt. Henry I. Raymond, Asst. Surgeon, is relieved from duty with Thirteenth U. S. Infantry and ordered to Camp George H. Thomas, Chickamauga National Park, Ga.

Capt. Charles F. Kieffer and First. Lieut. Powell C. Fauntleroy, Asst. Surgeons, ordered to Tampa, Fla., for duty.

Capt. Ogden Rafferty, Asst. Surgeon, ordered to Key West, Fla., for duty in the general hospital at that place.

Capt. William C. Gorgas, Asst. Surgeon, ordered to duty on U. S. hospital ship "Relief."

Capt. John S. Kulp, Asst. Surgeon, is relieved from duty in Dept. of the Columbia, and ordered to report in person to the Surgeon-General of the Army for further orders.

Capt. Edward C. Carter, Asst. Surgeon, will proceed to Chattanooga, Tenn., for the purpose of establishing a general hospital in the Chattanooga Park Hotel, to be known as the Leiter General Hospital, in accordance with such instructions as he may receive from the Surgeon-General of the Army.

Capt. William D. Crosby, Asst. Surgeon, will report to the Major General commanding the Dept. of the Pacific, for duty with the expedition to the Philippine Islands.

Acting Asst. Surgeon Edwards C. Poëy, U. S. A., ordered to Tampa, Fla., for duty.

Acting Asst. Surgeon J. R. Shannon, U. S. A., ordered to Tampa, Fla., for duty.